PB83-187815

Preliminary Evaluations of Initial TSCA (Toxic Substances Control Act) Section 8 (e) Substantial Risk Notices

(U.S.) Environmental Protection Agency
Washington, DC

Mar 83

U.S. Department of Commerce
National Technical Information Service
NTIS

United States
Environmental Protection
Agency

Office of Pesticides
and Toxic Substances
Washington, D.C. 20460

EPA-560/2-83-001
March 1983

PB83-137815

Toxic Substances

EPA

Preliminary Evaluations of Initial TSCA Section 8(e) Substantial Risk Notices

February 1, 1980 - December 31, 1982

REPRODUCED BY
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INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

NOTICE TO ADMINISTRATOR OF SUBSTANTIAL RISKS. "Any person who manufactures, processes, or distributes in commerce a chemical substance or mixture and who obtains information which reasonably supports the conclusion that such substance or mixture presents a substantial risk of injury to health or the environment shall immediately inform the [EPA] Administrator of such information unless such person has actual knowledge that the Administrator has been adequately informed of such information."

-- Section 8(e), Toxic Substances Control Act (1976)

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Office of Pesticides and Toxic Substances (TS-788)
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401 "M" Street, S.W.
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20460

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This volume contains, in ascending submission number order, "status reports" (i.e., preliminary evaluations) prepared by staff of the Office of Toxic Substances in the Office of Pesticides and Toxic Substances for initial submissions received by EPA from chemical manufacturers, processors, and distributors between February 1, 1980, and December 31, 1982, pursuant to Section 8(e), the "substantial risk" information reporting provision of the Toxic Substances Control Act (TSCA; 90 Stat. 2029, 15 U.S.C. 2607). The status reports contained in this volume reflect only the initial phases of EPA's evaluation process for the submitted information.

This TSCA Section 8(e) status report volume has been published by EPA for two reasons. First, a volume of 8(e) status reports will make the submitted information more accessible. Second, this volume may, by providing specific examples of submitted information and EPA's preliminary evaluation of that information, help those persons subject to Section 8(e) of TSCA to understand better the types of information that should be submitted.

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EPA 560/2-83-001
March 1983

PRELIMINARY EVALUATIONS OF INITIAL TSCA SECTION 8(e) SUBSTANTIAL RISK NOTICES

FEBRUARY 1, 1980 TO DECEMBER 31, 1982

Office of Toxic Substances
Office of Pesticides and Toxic Substances
Washington, D.C. 20460

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES AND TOXIC SUBSTANCES
WASHINGTON, DC 20460

Disclaimer

This volume has been reviewed by the Office of Pesticides and Toxic Substances (OPTS), U.S. Environmental Protection Agency, and approved for publication. The status reports contained in this volume present the Agency's preliminary evaluations of the submitted information and do not represent final Agency policy or intent with respect to the submissions or subject chemicals. Mention of company names, trade names, or commercial products does not constitute Agency endorsement or recommendation.

Foreward

This volume contains, in ascending submission number order, "status reports" (i.e., preliminary evaluations) prepared by staff of the Office of Toxic Substances (OTS) in the Office of Pesticides and Toxic Substances (OPTS) for initial submissions received by EPA from chemical manufacturers, processors, and distributors between February 1, 1980, and December 31, 1982, pursuant to Section 8(e), the "substantial risk" information reporting provision of the Toxic Substances Control Act (TSCA; 90 Stat. 2029, 15 U.S.C. 2607). Status reports are prepared by OTS for all initial TSCA Section 8(e) submissions and reflect only the initial phases of the OTS evaluation process for such information.

This volume is being distributed through the Industry Assistance Office (IAO) in OTS/OPTS. Those persons wishing to obtain a copy of this volume of Section 8(e) status reports should telephone IAO (toll-free: 800-424-9065 or, in Washington, D.C.: 554-1404), or write to:

Industry Assistance Office (TS-799)
U.S. Environmental Protection Agency
401 "M" Street, S.W.
Washington, D.C. 20460

EPA plans to print a limited number of copies of this volume. After the Agency's supply is exhausted, copies can be purchased through the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, Virginia 22161. Copies of the two previously published Section 8(e) status report volumes (PB# 80-221609 and PB# 81-145732) are currently available through NTIS.

The Agency welcomes submission of additional information for or comments on the evaluations presented in this volume. The submission of unpublished information relating to biological/environmental effects, production/importation volumes, use(s), and worker, consumer, and environmental exposure to the subject chemical substances and mixtures would be especially valuable. Such information will be considered by OTS at subsequent steps in the OTS chemical assessment process. Submission of additional information for or comments on these evaluations should be directed to:

Mr. Frank D. Kover, Chief
Chemical Hazard Identification Branch
Assessment Division (TS-778)
Office of Toxic Substances/OPTS
U.S. Environmental Protection Agency
401 "M" Street, S.W.
Washington, D.C. 20460

All TSCA Section 8(e) submissions as well as EPA status reports can be viewed in the OPTS public files (subject to claims of confidentiality made by submitting companies). The OPTS public files are located at EPA Headquarters (Room 107, East Tower), 401 "M" Street, S.W., Washington, D.C. Persons wishing to obtain copies of actual TSCA Section 8(e) submissions should write to EPA's Freedom of Information Office at the following address and include the desired Section 8(e) submission numbers.

Freedom of Information Office (A-101)
U.S. Environmental Protection Agency
401 "M" Street, S.W.
Washington, D.C. 20460

This and previous volumes of Section 8(e) status reports have been published by EPA for two reasons. First, volumes of 8(e) status reports will make reported information more accessible. Second, such volumes may, by providing specific examples of submitted information and EPA's evaluation of it, help those persons subject to Section 8(e) of TSCA to understand better the types of information that should be submitted.

Joseph J. Merenda, Director
Assessment Division/OTS/OPTS

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Acknowledgment

In preparing the status reports contained in this volume, staff of EPA's Office of Pesticides and Toxic Substances (OPTS) have frequently found it necessary to request further information about or clarification of the submitted data. OPTS appreciates the effort and cooperation of the following companies and organizations that have submitted the information evaluated in this volume:

3M COMPANY
A. B. DICK COMPANY
AIR PRODUCTS AND CHEMICALS, INC.
ALLIED CHEMICAL CORPORATION
AMCHEM PRODUCTS, INC.
AMERICAN CYANAMID COMPANY
ARMAK COMPANY
ASARCO INCORPORATED
ATLANTIC RICHFIELD COMPANY
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BUFFALO COLOR CORPORATION
CALLERY CHEMICAL COMPANY
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INTERNATIONAL LEAD ZINC RESEARCH ORGANIZATION INC.
INTERNATIONAL MINERALS & CHEMICALS CORPORATION
KERR-MCGEE CORPORATION
LEVER BROTHERS COMPANY (INCORPORATED)
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MARTIN MARIETTA CHEMICALS

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MCB MANUFACTURING CHEMISTS, INC.
MOBIL RESEARCH AND DEVELOPMENT CORPORATION
MONTGOMERY ELEVATOR COMPANY
NALCO CHEMICAL COMPANY
OLIN CORPORATION
PENNWALT CORPORATION
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STEPAN CHEMICAL COMPANY
SUN CHEMICAL CORPORATION
SUN REFINING AND MARKETING COMPANY
TENNECO CHEMICALS, INC.
TENNESSEE EASTMAN COMPANY
UNION CARBIDE CORPORATION
UNION OIL COMPANY OF CALIFORNIA
UPJOHN COMPANY
VELSICOL CHEMICAL CORPORATION
VULCAN CHEMICALS
WESTERN ELECTRIC
WILMINGTON CHEMICAL CORPORATION
WITCO CHEMICAL CORPORATION

Introduction

Section 8(e) of the Toxic Substances Control Act (TSCA; the Act) states that "any person who manufactures, processes, or distributes in commerce a chemical substance or mixture and who obtains information which reasonably supports the conclusion that such substance or mixture presents a substantial risk of injury to health or the environment shall immediately inform the [EPA] Administrator of such information unless such person has actual knowledge that the Administrator has been adequately informed of such information."

In view of the fact that Section 8(e) was self-effectuating and required no implementing rules, manufacturers, processors, and distributors of chemicals became subject to Section 8(e) reporting as of January 1, 1977, the effective data of TSCA. In order to clarify the types of information to be submitted and the procedures for doing so, EPA (following receipt and review of public comments) published its March 16, 1978, TSCA Section 8(e) policy statement ("Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" 43 FR 11110). For easy referral when using this volume, the March 16, 1978, TSCA Section 8(e) policy statement has been reproduced as Appendix A in the back of this volume.

The March 16, 1978, TSCA Section 8(e) policy statement expresses the Agency's policy that the information subject to Section 8(e) reporting is any "new" information that "reasonably supports" the conclusion that a chemical substance or mixture presents a substantial risk of injury to health or the environment but need not necessarily conclusively indicate such risk. A determination of "substantial risk" does not include an evaluation of economic or social benefits of the use of the chemical and, therefore, is not synonymous with the term "unreasonable risk" found in other sections of the Act. Although EPA's receipt of information under Section 8(e) of TSCA does not necessarily trigger immediate regulatory action, the information which is submitted under Section 8(e) does receive priority review and evaluation by EPA in order to determine an appropriate course of Agency action.

Thus far, both EPA and the chemical industry have devoted significant efforts in fulfilling their respective responsibilities under Section 8(e) of the Act. Since January 1, 1977, over 460 initial TSCA Section 8(e) notices covering a wide range of chemical toxicity/exposure information have been received and given priority evaluation and follow-up attention by the Office of Toxic Substances (OTS). In general, each initial TSCA Section 8(e) submission is promptly reviewed and evaluated by OTS scientific staff in order to determine both the degree of concern that should be attached to the submitted information and the initial course of any warranted OTS follow-up action. A "Status Report" is prepared which contains a brief description of the submitted information, the results of the OTS preliminary evaluation, a statement with respect to the current production and use of the subject chemical(s), and the recommendations for appropriate OTS follow-up actions. Upon approval of the status report, the recommended follow-up actions are initiated. A letter containing the status report and any EPA requests for additional information is sent to the submitting company. In addition, copies of all status reports are transmitted to the OPTS public files, other designated EPA Offices and Federal Agencies, the Industry Assistance Office (IAO/OTS/OPTS), and the Office of Toxics Integration (OTI/OPTS) for further distribution. Other OTS follow-up actions include consideration of further, more in-depth assessment of a reported chemical hazard or risk. It should also be noted that the Office of Toxic Substances immediately reviews, evaluates, and initiates appropriate follow-up activities for all information contained in "follow-up" and "supplemental" TSCA Section 8(e) notices. By definition, follow-up submissions are those that contain information submitted directly in response to an EPA request whereas supplemental submissions are those that contain information not requested by EPA.

A Document Control Number is used by EPA to identify Section 8(e) submissions and takes the following form: 8EHQ-0000-0000. Starting at the left, the first four symbols identify the information as a Section 8(e) submission received by EPA headquarters; the next four digits identify the month and year (e.g., -0579-) of EPA's receipt of the information; the final four digits identify the submission's chronological number. In addition to the basic numerical sequence, characters may be added to the right end of the Document Control Number to convey other information. These additional characters and their meaning are as follows:

S: indicates that the Section 8(e) submission was sanitized to remove information claimed by the submitting company as "TSCA Confidential Business Information";

P: indicates that the Section 8(e) submission contained names or other identification (e.g., Social Security Numbers) of individuals, the release of which may violate the Privacy Act (such documents are sanitized to remove names or other identifiers);

*: indicates that based on a preliminary evaluation, the submission was considered by EPA to be unwarranted for TSCA Section 8(e) reporting.

When reading the status reports contained in this compendium, one should realize that the purpose of the OTS preliminary evaluation is to determine the significance of the submitted information in terms of a need for possible follow-up action by the Agency. This determination involves a critical analysis of the submitted data to assess the extent that the reported hazard or risk is supported by the provided information. The scope of this initial evaluation, however, is generally limited to the submitted documents and to any closely related information known by the OTS reviewer. Neither a literature search to identify other reported effects nor an in-depth analysis of possible sources of exposure to subject chemicals is part of the evaluation process. Therefore, a status report should be viewed only as a preliminary evaluation of the submitted information and not as a comprehensive assessment of the chemical substance or mixture for which a TSCA Section 8(e) notice has been filed.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0280-0331S
8EHQ-0480-0336S
Page 1 of 3

DATE: JUL 21 [illegible]

SUBJECT: Status Report *8EHQ-0280-0331S
8EHQ-0480-0336S

Approved 7/21/80

FROM: Frank D. Kover, Chief Justine Welch for
Chemical Hazard Identification Branch

Revision
Needed

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

In two separate submissions, the Henkel Corporation reports that 1,4-dioxane (CAS No. 123-91-1) has been detected by gas chromatography in two of its polyalkoxylated polyamine products. Although the exact chemical identities of the subject products have been claimed confidential, the submitter states that the two products are marketed under the tradenames POLYQUART® H and STANAX® 1166. POLYQUART® H is reported to contain between 1.5% to 2% (i.e. 15,000-20,000 ppm) dioxane and the STANAX® 1166 is reported to contain between 1.1% to 1.7% (i.e. 11,000-17,000 ppm) dioxane.

Submission Evaluation

Like many polyethylene glycols, 1,4-dioxane (an anhydride of diethylene glycol) can produce toxic effects in the kidney and liver (in humans). A characteristic nephrosis of the kidney tubules (hydropic degeneration) with associated liver cell necrosis can occur regardless of the route of 1,4-dioxane exposure (inhalation, oral ingestion, and/or skin application). Because of this, there is definite concern about human exposure to any product or material containing significant amounts of 1,4-dioxane.

Based on the information provided in the submissions, 1,4-dioxane levels as high as 200-1000 ppm could be present in certain cosmetics formulated with POLYQUART® H. The submitter states that this particular end-use exposure to 1,4-dioxane "would be brief in most cases as formulations are usually removed by water-wash after use." In addition, undiluted textile finishing products formulated with STANAX® 1166 (antistatic agent) may contain up to 2000 ppm 1,4-dioxane. The submitter reports in this case, that the 1,4-dioxane would be removed from finished

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

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textile fibers which are normally extracted and dried after treatment. The submitter also reports that although the 1,4-dioxane exposure to workers handling finished fibers and textile products is not known, the exposure is expected to be minimal.

The subject polyalkoxylated polyamine products appear to be sources for potentially significant dermal and, under certain conditions, inhalation exposures to 1,4-dioxane. Depending on duration, these exposures could lead to the serious human health effects previously mentioned.

Current Production and Use

Due to the fact that confidentiality has been claimed by the submitter for the exact chemical identities of both POLYQUART® H and STANAX® 1166, a review of the non-confidential TSCA Inventory (1977) production/importation ranges will not appear in this status report.

A review of the production range (includes importation volumes) statistics for 1,4-dioxane (CAS. No. 123-91-1) which is listed in the initial TSCA Inventory has shown that between 2 million and 15 million pounds of this chemical were produced/imported in 1977.**/

According to the submitter, POLYQUART® H is used as a component in cosmestics and STANAX® 1166 is used as an antistatic agent in final formulated products used in textile treatment. No other use information on either product was located in the secondary literature sources consulted.

Comments/Recommendations

The Henkel Corporation reports that it is continuing the investigation of this situation and will advise the EPA of newly developed information. The submitting company also plans to develop processes for reducing or eliminating the 1,4-dioxane content in its products. The submitter reports that interim steps have been taken to protect manufacturing employees. Henkel is also notifying customers of the findings of 1,4-dioxane contamination and providing them with recommendations for safe handling and use.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

In 1974, OSHA set the current occupational standard for 1,4-dioxane exposure at an 8 hr. time-weighted average (TWA) of 100 ppm in air (39 CFR 23540). An evaluation of the carcinogenic risk of 1,4-dioxane to man has been prepared by the International Agency for Research on Cancer (IARC Monograph, Vol. 11, 1976). In 1977, NIOSH recommended that the occupational exposure to 1,4-dioxane be controlled so that workers are not exposed at airborne concentrations greater than 1 ppm (3.6 mg/cu m) based on a 30-minute sampling period (DHEW (NIOSH) Publication No. 77-226).

Based on the results of its bioassay of 1,4-dioxane for possible carcinogenicity, the National Cancer Institute (1978) has concluded that:

> "Under the conditions of this bioassay, 1,4-dioxane induced hepatocellular adenomas in female Osborne-Mendel rats. 1,4-Dioxane was carcinogenic in both sexes of rats, producing squamous-cell carcinomas of the nasal turbinates, and in both sexes of B6C3F1 mice, producing hepatocellular carcinomas." (DHEW (NIH) Publication No. 78-1330)

The Agency has recently received other 8(e) submissions (8EHQ-1179-0320, 8EHQ-0979-0326S, and 8EHQ-0180-0326 Supplement) which also reported the detection of 1,4-dioxane in other ethoxylated products.

A Chemical Hazard Information Profile (CHIP) on 1,4-dioxane has been prepared by the Chemical Hazard Identification Branch/AD. The Chemical Review and Evaluation Branch/AD is now preparing an indepth source and health/environmental effects assessment (Phase I) for 1,4-dioxane.

a) The Agency should transmit copies of these submissions and status reports to NIOSH, OSHA, CPSC, FDA, OWWM, and CREB/AD. In addition, the Industry Assistance Office (IAO/OPII) should consider transmitting the same information to the manufacturer(s)/importer(s) of the subject polyalkoxylated polyamines listed in the master TSCA Inventory.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0280-0332
page 1 of 3

Approved 6/16/80

Revision Needed

DATE: JUN 4 1980

SUBJECT: Status Report *8EHQ-0280-0332

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph Merenda, Director
Assessment Division

Submission Description

The International Lead Zinc Research Organization, Inc. (ILZRO) has provided three progress reports from an ongoing epidemiology study designed to determine the potential health risks of cadmium (Cd, CAS No. 7440-43-9). This ILZRO-sponsored study is being performed in Belgium.

The latest of the submitted progress reports (January 1979 to June 1979) states that the investigation suggests that a group of aged women who have lived in a cadmium-polluted area of Belgium have higher cadmium body burden (which is reflected by an increased excretion of cadmium in the urine and a higher prevalence of signs of renal dysfunction) than the aged women serving as the present control group.

The ILZRO states that although it is not a manufacturer, processor, or distributor as defined by the Toxic Substances Control Act (TSCA) and is not subject to the reporting requirements of Section 8(e), it is providing the progress reports from this epidemiology study under Section 8(e) because it is felt that the "information concerning this study should be included in EPA's body of knowledge of the potential health risks of cadmium."

Submission Evaluation

There is no doubt the provided data demonstrate that cadmium cumulates in the human body and that the duration of exposure is important. The proteinuria values indicate that the exposed women's kidneys functioned less efficiently than those of the unexposed women when measured by this parameter. The other measures of kidney function do not show a major difference in kidney performance between the two groups.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Epidemiological studies on the renal toxicity of cadmium, particularly as they relate to hypertension, will have to be backed up by well designed studies in animals.

It appears that the final report may be useful to the Agency for its ongoing assessment of the potential health risks of exposure to cadmium. The progress reports which have been provided thus far, however, are somewhat vague with respect to the methodologies used in this study. The Agency should therefore request the following additional information:

1. A description of the analytical methods used for determining the biological parameters reported.

2. A description of the specific criteria and pollution data used in selecting the industrial control, non-industrial control, and cadmium polluted areas for this study is needed. It should be noted that the industrial control area contains steel industries, which have been associated with cadmium pollution.

3. More detail is needed regarding the criteria for selection of the populations and individuals surveyed in these three locations. Progress report no. 1 indicates that the women were institutionalized (i.e. living in retirement homes). The levels of cadmium in institutional diets have generally been reported as higher than in average or typical diets.

4. The Agency is interested to know why the measuring of lead in the urine was discontinued.

5. Copies of all subsequent progress reports and of the final report as soon as they become available.

Current Production and Use

A review of the production range (includes importation volumes) statistics for cadmium (CAS No. 7440-43-9) which is listed in the initial TSCA Inventory has shown that between 1.6 million and 16 million pounds of this chemical were produced/imported in 1977.**/

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Cadmium is used for electrodeposited and dipped coatings on metals; bearing and low-melting alloys; electrical equipment; brazing alloys; fire-protection systems; nickel-cadium storage batteries; power transmission wire; TV phosphors; basis of pigments used in ceramic glazes, machinery enamels, baking enamels; Weston standard cell; control of atomic fission in nuclear reactors; fungicides; photography and lithography; and in selenium rectifiers.

Comments/Recommendations

The International Agency for Research on Cancer has evaluated the carcinogenic risk to man from exposure to cadmium and other selected inorganic and organometallic compounds (IARC Monograph Vol. 2; 1973). NIOSH has published criteria for a recommended standard for the occupational exposure to cadmium (August 1976).

The Chemical Review and Evaluation Branch (CREB/AD) has prepared an indepth source and health/environmental effects assessment (Phase I) for cadmium.

a) The submitting organization should be requested to provide all of the information specified in the Submission Evaluation section of this status report.

b) The Agency should transmit copies of the submission and status report to OSHA, NIOSH, CPSC, OAQPS, OWWM, OPP, and CREB/AD.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0280-0333
8EHQ-0280-0333 Supplement
Page 1 of 3

Approved

Revision Needed

DATE: SEP 12 1980

SUBJECT: Status Report* 8EHQ-0280-0333
8EHQ-0280-0333 Supplement

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division (TS-792)

Submission Description

In its initial submission, the Kerr-McGee Corporation reported that two of its marketed products, Kermac 600W (CAS No. 64742-46-7) and Kermac 218a (CAS No. not provided), were found to be mutagenic to selected Salmonella bacterial strains in the Ames test.

Kerr-McGee reported that it produced and sold Kermac 600W. The Kermac 218a product was reported to be bought for resale from another company. The submitter also reported that "occasional minor dermatitis from prolonged skin contact" was the only adverse human health effect found in over 12 years of Kermac 600W production. The submitter also provided a copy of the Kermac 600W "Material Safety Data Sheet" and that product's typical chemical/physical specifications.

In the cover letter to the original submission, Kerr-McGee made the following statement with regard to Ames testing in general: "We recognize the controversial nature of the Ames test and its imprecision for such determinations. We also understand that the Salmonella strains used by [the performing laboratory] do not have repair capability, which in the opinion of some authorities makes the tests rather harsh. Additionally it is well known that Ames test data are not translatable to human effects."

In the supplemental submission, the EPA was notified that Kerr-McGee no longer produces or sells Kermac 600W. In its place, Kermac 600 (CAS No. 64741-44-2) is now produced and sold. Although the submitting company states that it does not have any information on the Kermac 600 product that reasonably supports the existence of a substantial risk, Kermac 600 is reported to be similar to Kermac 600W in composition, constituents, and physical properties, and is the petroleum feed-stock from which Kermac 600W was produced via hydrotreating.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

In general, the EPA agrees with the performing laboratory conclusions regarding the submitted Ames test results. Based on the dose levels tested (10 to 200 microliters/plate), both Kermac 600W and 218a were demonstrated to be mutagenic in selected bacterial strains *in vitro*.

Both with and without the rat liver metabolic activation system, the Kermac 218a product was found to be mutagenic to *Salmonella* bacterial strains TA 1535, TA 1537, and TA 98. Kermac 218a was also found to be positive in the TA 1538 strain; the addition of metabolic activation eliminated this mutagenic response. According to the performing laboratory, metabolic activation of Kermac 218a was required to induce a mutagenic response in the TA 100 strain. However, without a description of the way in which the normal number of spontaneous revertants was applied to the reported revertant values for TA 100, the Agency considers the mutagenic response in this particular bacterial strain to be at most marginal.

In addition, the Kermac 600W product was found to be mutagenic in all tested bacterial strains (listed above), both in the presence and absence of metabolic activation.

With regard to human toxicity, the attachment to the provided "Material Safety Data Sheet" indicates that excessive inhalation of Kermac 600W may cause "local irritation, drowsiness, collapse, muscle twitching, coma, and later pneumonia." The data sheet also warns that contact with the eyes will cause severe irritation and that prolonged or frequent periodic skin contact may lead to irritation and dermatitis.

Current Productions and Use

Kermac 600 is a straight-run middle distillate of petroleum crude oil. Distillates of this type contain hydrocarbons predominantly in the C_{11}-C_{20} range, and have a boiling range of 205°C to 345°C. A review of the production range (includes importation volumes) statistics for straight-run middle distillate of petroleum crude oil (CAS. No. 64741-44-2) which is listed in the initial TSCA Inventory, has shown that over 89 billion pounds were produced/imported in 1977.**/

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production/ importation range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Kermac 600W, which is a hydrotreated middle distillate obtained by treating a petroleum fraction with hydrogen in the presence of a catalyst, consists of hydrocarbons predominantly in the C_{11}-C_{25} range and has a boiling range of 205°C to 400°C. A review of the production range (includes importation volumes) statistics for hydrotreated middle distillate of petroleum oil (CAS No. 64742-46-7) which is listed in the initial TSCA Inventory, has shown that over 15 billion pounds were produced/imported in 1977.**/

The submitter states that the Kermac 600W is used as a mineral seal oil and that one customer may use it in the formulation of printing inks.

No information on the production and/or typical uses of Kermac 218a was provided or located. The CAS No. and uses of this product should be requested from the submitter.

Comments/Recommendations

With regard to the submitter's statements concerning the Ames test, the Agency believes that *in vitro* mutagenicity assays of this type provide valuable data that can aid in assessing the possible risks posed by chemicals to health and the environment. Although Ames test results, when considered alone, may not be sufficient to provide reasonable support for a conclusion of substantial risk, the addition of information concerning high production of and/or exposure to the chemical would suggest the need for further testing.

The Kerr-McGee Corporation states that certain customers/suppliers were advised of the original Section 8(e) notification on Kermac 600W and Kermac 218a. In addition, the submitter states that EPA will be contacted should any other relevant information become available.

The EPA has received and evaluated previous Section 8(e) submissions (8EHQ-0879-0301 and 8EHQ-0879-0301 Supplement) on the mutagenicity of Home Heating Oil Number 2, which contains straight-run middle distillate of petroleum oil (CAS No. 64741-44-2).

a) The Kerr-McGee Corporation should be requested to provide the CAS No. and any available information on the use(s) of the Kermac 218a product which is reported to be bought for resale. In addition, the submitting company should be asked if it has done or plans to do toxicological tests on Kermac 600.

b) The Agency should transmit copies of the submissions and status report to DOE, OSHA, NIOSH, OWWM, and ORD.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0280-0334
Page 1 of 2

DATE: JUN 17 1980

SUBJECT: Status Report* 8EHQ-0280-0334

Approved JJM 6/17/80

Revision Needed ______

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch (TS-792)

TO: Joseph J. Merenda, Director
Assessment Division (TS-793)

Submission Description

The BF Goodrich Company has submitted a summary of the results from a battery in vitro mutagenicity tests on N-oxydiethylene thiocarbamyl-N-oxydiethylene sulfenamide (CAS No. 13752-51-7) and N-oxydiethylene-2-benzothiazyl sulfenamide (CAS No. 102-77-2). The submitter reports that each compound was shown to give positive results in several of the performed short-term assays. In providing this toxicity information under Section 8(e) the submitter states "these tests, which are verifiable and reliable, may 'reasonably support the conclusion' that [both compounds] are mutagenic and therefore may present substantial risk to health."

Submission Evaluation

As reported, the results from several of the performed in vitro studies do indicate that both compounds have a mutagenic potential. Complete copies of the protocols and data from the tests cited in the submission should be requested.

Current Production and Use

A review of the production range (includes importation volumes) statistics for CAS No. 13752-51-7 and CAS. No. 102-77-2, which are listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a).**/

**/ The data submitted for the TSCA Inventory including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

BF Goodrich reports that the subject chemicals are solids which are used in rubber processing.

Comments/Recommendations

The submitting company reports because the subject chemicals are solids, dust control is necessary and normally used to minimize exposure. The manufacture of both chemicals are reportedly carried out in closed systems. The company believes that "low risk use of these materials can be achieved through the application of existing control practices."

a) BF Goodrich should be requested to provide complete copies of protocols and test data from all of the studies cited in this submission.

b) The company should also be requested to describe the actions it has taken, in light of this toxicity data, to warn workers and customers, and to further reduce and/or eliminate exposure to the subject chemicals.

c) The Agency should transmit copies of this submission and status report to NIOSH, OSHA, CPSC, and FDA. The Industry Assistance Office (IAO/OPII) should consider transmitting the same information to the manufacturers of the subject chemicals listed on the TSCA Inventory.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0380-0335S
8EHQ-0680-0335 Supplement
Page 1 of 2

Approved 7/2/80

Revision Needed ______

DATE: JUL 1 1980

SUBJECT: Status Report* 8EHQ-0380-0335S
8EHQ-0680-0335 Supplement

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch (TS-792)

TO: Joseph J. Merenda, Director
Assessment Division (TS-792)

Submission Description

In its initial submission the Gulf Oil Company-U.S. reported that an undiluted, water-soluble cutting oil (Gulfcut Heavy Duty Soluble Oil) had produced irreversible damage to the eyes (irritation and corneal opacities) of several rabbits during a standard test for eye irritation. The Company stated that additional testing was planned at several representative oil/water ratios in order to further define the observed eye toxicity.

In a subsequent submission (8EHQ-0680-0335 Supplement) the company reported the summarized results of the additional testing. Based on those results, the company concluded that a 1:10 oil/water dilution did not produce any corneal opacities or corneal involvement of any kind in the rabbit eyes. Inflammation of the iris was reported to have cleared at 72 hours after treatment. Although the 1:10 dilution is reported to be a primary eye irritant according to the Federal Hazardous Substances Act, the submitter states that the observed primary eye irritation was completely reversible and was less severe than that observed previously with the concentrated product.

Submission Evaluation

Several of the ingredients in this water-soluble cutting oil are known to be mucous membrane and skin irritants. In addition, one of the components has a structural relationship to compounds which can exhibit anticholinesterase activity regardless of the route of exposure. Several other ingredients may facilitate absorption of toxic materials.

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Exposure to a mist of the cutting oil product, regardless of dilution with water, could still cause irritation of the ocular and nasal mucous membranes. In addition, the product (via inhalation of the mist) could find its way to the lung proper and possibly produce a pneumonitis.

Current Production and Use

The submitter reports that under the TSCA Inventory reporting regulations, this concentrated product is a "mixture" and is listed by its brand name - Gulfcut Heavy Duty Soluble Oil. The Gulf Oil Company-U.S. has claimed the identities and weight percents of the chemical components of this mixture as confidential.**/

The submitter states that the product is normally used as an oil-water emulsion in the metalworking industry at concentrations of one part oil to 10-100 parts water.

Comments/Recommendations

The submitter states that no further testing of Gulfcut Heavy Duty Soluble Oil is planned at this time.

a) The submitting company should be requested to provide complete copies of the protocols and data from the studies cited in these submissions.

b) In addition, the company should be requested to describe the actions it has taken, in light of the submitted toxicity data, to warn workers and customers, and to reduce or eliminate exposure to the subject product.

c) The Agency should transmit copies of these submissions and status report to NIOSH, OSHA, and CPSC.

**/ The data submitted for the TSCA Inventory including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: JUL 21 1980

SUBJECT: Status Report 8EHQ-0480-0336 S

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Please refer to the status report prepared for 8EHQ-0280-0331 S

EPA FORM 1320-6 (REV. 3-76)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0480-0337
Page 1 0f 3

DATE: JUN [illegible] 1980

SUBJECT: Status Report* 8EHQ-0480-0337

Approved 6/11/80

Revision Needed ______

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch (TS-792)

TO: Joseph J. Merenda, Director
Assessment Division (TS-792)

Submission Description

The Pennwalt Corporation has submitted the results from a long-term carcinogenicity bisoassay on vinylidene fluoride (VDF; CAS No. 75-38-7). The submitting company reports that it had obtained the results from this study (Maltoni and Tovoli; 1979) from a recent Italian scientific journal. The published results indicate that vinylidene fluoride had apparently produced an increased incidence of fat tissue tumors (lipomas and liposarcomas) at the highest dose (8.25 mg/kg) administered orally to rats. The submitter points out that the Italian authors state in their conclusion that "this report is the first on the long-term effect of VDF and represents the first indication of its potential carcinogenicity."

In providing this toxicity information under Section 8(e), the Pennwalt Corporation states that although it" is not ready to conclude that this report constitutes 'substantial risk information'", the company does believe "that the public interest is best served by assuming that the report may represent" such information and that it is acting accordingly.

Submission Evaluation

The study by Maltoni and Tovoli (1979) establishes that vinylidene fluoride is a carcinogen under the conditions of the experiment. However, several issues should be addressed before the study is accepted as decisive.

1. What was the purity of the VDF tested?
2. VDF boils at -84°C. How much VDF remained in solution in the olive oil vehicle at a stomach temperature of 40°C?

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What assurances can be provided that the VDF was not promptly exhaled or expelled as a gas?

3. What was the evidence that VDF actually entered the body? VDF is known to release fluoride ions that can be detected in blood and urine (Dilley et al.; 1974). Was an attempt made to detect fluoride ions in these body fluids?

4. A contemporary study (Stockle et al.; 1979) has been performed in which VDF was administered by inhalation to rats. VDF, in common with analogous chlorine and bromine compounds, produced preneoplastic changes in liver. Maltoni and Tovoli (1979) observed intra-abdominal liposarcomas. This raises suspicion that VDF formed a stable substance with something in the olive oil (oxide?, peroxide?, unsaturated materials?). This stable complex could have been transported to mesenteric and omental fat depots where it was degraded to release fluoride ion. Fluoride ion is known to inhibit enzymes involved in lipid metabolism. Were fat depots analyzed for fluorine?

A study by Lester and Greenberg (1950) demonstrated that VDF is an anesthetic in rats when inhaled. This indicates that inhaled VDF can be absorbed into the body and taken up by brain and possibly other tissues (also Stockle et al.; 1979). Excretion of the fluoride ion (stripped from VDF by the liver) is via the kidneys. The differences between oral and inhalation exposure is that inhaled VDF would probably be eliminated unchanged to a greater extent than ingested VDF. The latter exposure would result in a more extensive degradation by the liver.

Current Production and Use

A review of the production range (includes importation volumes) statistics for vinylidene fluoride (Cas. No. 75-38-7) as listed in the initial TSCA Inventory has shown that no 1977 production/importation was reported or that all of the production range data reported was claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a)).**/

The submitter reported however, that the 1977 U.S. production of VDF was estimated to be approximately 10 million pounds.

Vinylidene fluoride is used as an intermediate in polymers (e.g. polyvinylidene fluoride) and copolymers. To the submitter's knowledge there are no consumer uses of VDF monomer as such.

**/ The data submitted for the TSCA Inventory including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Comments/Recommendations

In light of the data presented in the 1979 Maltoni report, Pennwalt states that it will advise all VDF customers and Pennwalt employees, who have potential VDF inhalation exposure, of the contents of the Section 8(e) submission and provide them with copies of the Maltoni report.

In addition, the company reports that it will take necessary steps in an attempt to further reduce the possibility of employee exposure to inhalation of vinylidene fluoride.

Pennwalt also states that expert toxicologists will be retained in order to analyze the Maltoni study, decide if additional tests are necessary to determine whether VDF is a potential carcinogen via inhalation and if so, determine further workplace changes that may be necessary.

The Chemical Hazard Identification Branch (CHIB/AD) has an existing Chemical Hazard Identification Profile (CHIP) on vinylidene fluoride. NIOSH has an existing Criteria Document on the recommended standard for exposure to vinyl halides.

a) In light of the toxicity information presented in this submission, it is recommended that the existing CHIP on vinylidene fluoride be updated to include a discussion of these new data and any other additional relevant data.

b) The Agency should transmit copies of this submission and status report to NIOSH, OSHA, CPSC, FDA, NCI, ORD, and CAG. In addition the Industry Assistance Office (IAO/OPII) should consider transmitting the same information to all of the manufacturers of vinylidene fluoride listed on the TSCA Inventory.

References

Maltoni and Tavoli; (1979); Med. Lavoro; Vol.5; pg. 363-368.

Dilley *et al*.; (1974); Tox. Appl. Pharmacol.; pg. 582-590.

Stockle et al.; (1979); Toxicol. Lett.; Vol. 3; pg. 337.

Lester and Greenberg (1950); Arch. Ind. Hyg. Occ. Med.; Vol. 2; pg. 335-344.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0480-0338
Page 1 of 3

DATE: JUL 7 1980

SUBJECT: Status Report *8EHQ-0480-0338

Approved ____

Revision Needed ____

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch (TS-792)

TO: Joseph J. Merenda, Director
Assessment Division (TS-792)

Submission Description

The Lockheed Missiles & Space Company, Inc. has reported that two of its employees suffered "prolonged neurological damage" possibly due to their exposure to the breakdown products of an accidental exothermic reaction of HX999 - a chemical mixture reported to contain MY720 (tetraglycidyl methylenedianiline; CAS No. 28768-32-3) and Eporal (diaminodiphenyl sulfone [DDS]; CAS No. 80-08-0).

The company states that although a number of its workers were exposed to unknown concentrations of the breakdown products during the upset situation, "the symptoms displayed by most of the exposed employees were temporary and typical of exposures to such decomposition products."

Submission Evaluation

It is not surprising that some of the workers exposed to diaminodiphenyl sulfone and tetraglycidyl methylenedianiline developed neurological deficits.

Diaminodiphenyl sulfone is a drug (Dapsone) used in the treatment of malaria and leprosy. Neuropathy has been reported to occur in some patients undergoing treatments with this chemical.

The tetraglycidyl methylenedianiline has several structural features which could result in toxic effects including carcinogenicity (e.g. 4,4'-methylenedianiline is a suspected carcinogen). However, of particular interest to the present submission is the somewhat similar structural relationship of tetraglycidyl methylenedianiline to hemicholinium. Hemicholinium interferes with the incorporation of choline into acetylcholine in motor nerves. Such interference would result in muscle weakness.

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There are several issues which remain with regard to the submitted information. Namely:

1. The submitter's statement concerning worker symptoms "typical of exposure to such decomposition products" needs further clarification. What are these typical symptoms and their duration? Available medical diagnoses of all affected employees is needed. What are the chemical identities of the decomposition products? Has any attempt been made to quantitate the amounts of these materials? If so, what were the results and sensitivities of such analyses?

2. In particular, a complete description (e.g. medical diagnosis, if available) of the prolonged neurological symptoms and damage experienced by the two workers is needed.

Current Production and Use

No information on the production volumes or uses of the chemical mixture HX999 was located in the secondary literature sources consulted.

A review of the production range (includes importation volumes) statistics for diaminodiphenyl sulfone (CAS No. 80-08-0) which is listed in the initial TSCA Inventory has shown that between 10 thousand and 100 thousand pounds of this chemical were produced/ imported in 1977.**/

Diaminodiphenyl sulfone is used in medicine and as a curing agent for epoxy resins.

A review of the production range (includes importation volumes) statistics for tetraglycidyl methlyenedianiline (CAS No. 28768-32-3) which is listed in the initial TSCA Inventory has shown that between 1 thousand and 10 thousand pounds of this chemical were produced/imported in 1977.**/

Information on the uses of tetraglycidyl methylenedianiline was not located in the secondary literature sources consulted.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Comments/Recommendations

The submitting company states that as more conclusive information is developed on this situation, it will be provided for the Agency's consideration.

a) The submitting company should be requested to provide all of the information specified in the Submission Evaluation section of this status report.

b) In addition, the company should be requested to describe the actions it has taken in response to the reported toxicity to warn workers and others, and to reduce and/or eliminate exposure to the subject chemicals.

c) The Chemical Hazard Identification Branch (CHIB/AD) will review the requested information, revise this status report as appropriate, and recommend further assessment if warranted.

d) The Agency should transmit copies of this submission and status report to NIOSH and OSHA. The Industry Assistance Office (IAO/OPII) should consider sending the same information to the manufacturers/importers of the subject chemicals listed on the TSCA Inventory.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: APR 30 1980

8EHQ-0480-0339
Page 1 of 3

Approved 4/30/80

Revision Needed

SUBJECT: Status Report* 8EHQ-0480-0339

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The IBM Corporation has reported that 2,4,7-trinitrofluorenone (TNF; CAS No. 129-79-3), a component in charge-transfer complexes in certain electrophotographic copiers and printers, had produced positive results without metabolic activation in each of several short-term mutagenicity assays. The tests performed include an Ames Salmonella/microsomal mutation assay (his$^+$/his$^-$), a Chinese hamster ovary cell sister chromatid exchange assay, and a mammalian mutation assay with L5178Y mouse cells.

In providing a summary of the results from these tests under TSCA Section 8(e), the IBM Corporation states that based on the results, it believes that under the actual conditions of use of TNF in IBM products, "TNF does not pose a health hazard to operating and service personnel."

In addition, IBM officials met with the EPA on April 25, 1980 to discuss this submission and at that time expressed a willingness to cooperate fully with the Agency in the further evaluation of this situation.

Submission Evaluation

As reported, the summarized results do indicate that TNF is a direct-acting mutagen (i.e. does not require metabolic activation) in each of the performed bacterial and mammalian cell assays. Complete copies of the test protocols and data obtained from the studies cited in this submission should be requested in order to evaluate the described mutagenic potential of TNF.

It should be noted that upon a single oral administration to rats, Huggins and Yang (1962) found that TNF induced mammary gland tumors. The authors hypothesized that the strong electron-accepting property of TNF may play a role in its potent carcinogenicity. It is also important to point out that 2,4,7-trinitrofluorenone is structurally related to both 2-acetylaminofluorene (2-AAF), which is a potent multi-target carcinogen in rodents, and benzidine, which is a well-known human and animal carcinogen. It has been well-established that for carcinogenicity, both 2-AAF and benzidine require metabolic conversion to the hydroxamic acid form. Because nitroreductase and N-hydroxylase enzymes are present in all mammalian liver (as well as in some extrahepatic tissues) it is very likely that trinitrofluorenone would also be converted to a mono- and/or di- and/or tri-hydroxamic acid form via a similar metabolic pathway.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

TNF might also be expected to cause toxic effects similar to those caused by trinitrotoluene (TNT) and trinitrophenol (picric acid). These effects include: methemoglobinemia, anemia, formation of Heinz bodies in red blood cells, bone marrow injury, and liver dysfunction. In addition, TNF has a 2,4-dinitrobenzene moiety and, like 2,4-dinitrobenzene and TNT, would be expected to produce skin sensitization and eczematous skin lesions. The latter effect would probably be the most prevalent toxicity from exposure to TNF during copying procedures.

At the April 25, 1980 meeting with EPA, the submitter reported that TNF represents the photoelectrically active ingredient of the coating mixture which is deposited on the Mylar plastic lining of the printing drums in certain IBM copiers and printers. Thus, the TNF-containing surface comes in direct contact with the toner during the copying process. The submitter also stated that some TNF is tranferred to the toner.

In order for the EPA to determine the nature and extent of the possible exposure to TNF in copying processes, the following information should also be requested from the submitter:

1. A complete description of the processes and amounts in which TNF is employed by IBM in their electrophotographic copiers and printers (including model types) and an estimate of the total number of TNF-containing machines presently in use.

2. An estimate of "least-case" and "worst-case" TNF exposure which should include the following information: (a) the amount of TNF present in "spent" toner (i.e. toner which has been in contact with the TNF-containing printing surface), per unit weight of toner; (b) the amount of "spent" toner released per copy produced; and (c) the average amount of toner adhering to the paper in an electrophotographic copy.

Current Production and Use

A review of the production range (includes importation volumes) statistics for 2,4,7-trinitrofluorenone (Cas. No. 129-79-3) which is listed in the initial TSCA Inventory has shown that no 1977 production/importation was reported or that all of the production range data reported was claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a)).**/

Other than the use information provided by the submitting company, no additional information was located in the secondary literature sources consulted.

Comments/Recommendations

IBM reports that the submitted toxicity information is also being provided to its employees, customers, and others who may use IBM products containing TNF.

Trinitrofluorenone is currently listed on the proposed Section 8(a) "Preliminary Assessment Information Rule" (45 FR 13646).

a) The submitting company should be asked to provide all of the information requested in the Submission Evaluation section of this status report. In addition, IBM should be requested to describe in detail any additional testing it has done and/or planned to further define the toxicity of trinitrofluorenone.

b) It is recommended that a production and use profile (PUP) and a Chemical Hazard Information Profile (CHIP) be prepared on 2,4,7-trinitrofluorenone.

c) The Chemical Hazard Identification Branch/AD will review the additional information requested, revise this status report as appropriate, and recommend further follow-up assessment if warranted.

d) The Agency should transmit copies of this submission and status report to OSHA, NIOSH, CPSC, SAD/OPII, OAQPS, ORD, and NCI.

Reference

Huggins, C., and Yang, N.C.: "Induction and Extinction of Mammary Cancer," SCIENCE, Volume 137, pg. 257, (1962).

**/ The data submitted for the TSCA Inventory including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: AUG 7 1980

Page 1 of 11

SUBJECT: Status Report* 8EHQ-0680-0339
Followup Response "A"

Approved JM 8/7/80

Revision
Needed ____________

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

In its original TSCA Section 8(e) submission (8EHQ-0480-0339), the IBM Corporation reported that 2,4,7-trinitrofluorenone (TNF; CAS No. 129-79-3) had been found to be a direct-acting mutagen in several short-term in vitro bacterial and mammalian cell culture assays. IBM also reported that TNF is a component of charge-transfer complexes in certain IBM electrophotographic copiers and printers. The IBM Corporation stated in the original submission that based on the reported short-term test results, it believes that under the actual conditions of use of TNF in IBM equipment, there is no health hazard posed to operating or service personnel.

During a meeting at the EPA on April 25, 1980, IBM representatives discussed the original submission with Agency scientists and at that time indicated that some TNF is transferred to toner during electrophotographic processes. At that meeting, IBM expressed a willingness to cooperate fully with the Agency in the further investigation and evaluation of the situation.

In the status report prepared for the initial IBM Section 8(e) submission, the EPA provided its preliminary staff evaluation of the submitted toxicity information. It was determined at that time that additional TNF toxicity and exposure information was needed from IBM in order for the EPA to better determine the nature and extent of any possible risks of injury to human health posed by exposure to TNF in photocopying/printing processes.

Per the Agency's request in a followup letter (dated May 1, 1980), the IBM Corporation provided the following information on TNF:

A. Complete copies of the final results, including protocols and data, from the short-term in vitro mutagenicity tests cited in the original submission.

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B. Complete copies of the final results, including protocols and data, from a number of in vivo acute and chronic toxicity studies of TNF via several routes of administration.

C. Electrophotographic copying/printing process information including affected product models, the number of TNF-containing machines currently in use, the amounts of TNF employed in IBM equipment, and a "worst-case" TNF exposure estimate.

It is the purpose of the present status report to provide the Agency's preliminary evaluation of the above-listed information provided by the IBM Corporation.

Submission Evaluation

a. Mutagenicity (In Vitro)

The Ames *Salmonella* test results provided by IBM indicate that 4-nitroquinoline N-oxide (4-NQO), benzo(a)pyrene (BP) and 2,4,7-trinitrofluorenone (TNF) were mutagenic in this *in vitro* bacterial assay. TNF was shown to be mutagenic for bacterial strains TA 98 and TA 1538, both with and without metabolic activation. However, this mutagenic activity was somewhat reduced following the metabolic activation. 4-NQO was demonstrated to be mutagenic in strains TA 98, TA 1538, and TA 100, both with and without activation. Again the mutagenic response was reduced following the enzyme treatment. BP was shown to be mutagenic for strains TA 98 and TA 1538 following metabolic activation. The Agency agrees with the IBM interpretations of the results from these *in vitro* bacterial tests. Both TNF and 4-NQO are direct-acting bacterial mutagens (i.e. do not require metabolic activation for inducing a mutagenic response) and BP is a bacterial mutagen requiring metabolic activation.

The results from the mouse L5178Y lymphoma assay indicate that TNF and 4-NQO induced dose-related increases in forward mutation frequencies in mammalian cells in culture. It was found that both compounds were direct-acting and that added S-9 liver homogenate (metabolic activation) was not necessary for activity to be expressed. The Agency is again in agreement with the submitter's interpretations of the provided data. As in the Ames test, neither the TNF nor 4-NQO required metabolic activation for inducing increases in mutations. The addition of the metabolic activating system reduced both the cellular toxicity and the mutagenicity of both TNF and 4-NQO in this assay.

4-NQO and TNF induced, without metabolic activation, dose-related sister chromatid exchanges in Chinese hamster ovary cells in culture. Here again, the addition of the metabolic activation system was found to considerably reduce the toxicity of both compounds. The Agency agrees with IBM's interpretation of the data as provided. Both 4-NQO and TNF are active in this assay.

The Agency believes that the following conclusions can be drawn from the results of the in vitro mutagenicity assays as submitted by the IBM Corporation:

1. Without metabolic activation, TNF is approximately 10 times more potent than 4-NQO in the induction of mutagenic effects in the TA 98 strain of Salmonella. It should be noted that 4-NQO has been previously demonstrated as a potent in vitro mutagen and animal carcinogen, and is used as one of many laboratory standards in both mutagenicity and carcinogenicity testing. Metabolic activation reduced but did not completely eliminate the mutagenic activity of either 4-NQO or TNF in the TA 98 bacteria in the Ames test.

2. TNF produced a dose-related increase in the forward mutation frequency in cultured mouse cells, both with and without metabolic activation. This mutagenic activity is diminished but not eliminated by the addition of the metabolic activation system. 4-NQO appears to be a more potent mutagen than TNF in this assay.

3. TNF increased the rate of sister chromatid exchanges (SCEs) in cultured Chinese hamster ovary (CHO) cells by approximately 2 times the incidence seen in untreated cells. Metabolic activation is not required for TNF to exert its effect in CHO cells. 4-NQO was also active in this system but was more toxic for CHO cells than was TNF. Direct comparisons of results with unactivated TNF and 4-NQO are difficult to make because of differences in toxicity. When tested with metabolic activation, 4-NQO appears to be slightly more efficient as an inducer of SCEs than is TNF.

Apparently, IBM did not conduct in vitro mutagenicty assays on the charge-transfer complex (CTC) which is a combination of TNF and a polyvinyl carbazole resin. This should be confirmed with the submitter. (It should be noted that the Agency has previously prepared a status report for a Section 8(e) submission from the Xerox Corporation on vinyl carbazole monomer (8EHQ-0579-0286). In its submission, Xerox stated that the results from several in vitro studies indicated that vinyl carbazole monomer is a potential mutagen and carcinogen).

b. Carcinogenicity (In Vivo)

The initial evidence for the carcinogenic activity of 2,4,7-trinitrofluorenone (TNF) stems from the report of Huggins and Yang (Science, 137, 257 (1962)). TNF administered at a single oral dose of 100 mg to 50-65 day old female Sprague-Dawley rats induced a 35% mammary tumor incidence. At the same dose, the well-known aryl hydrocarbon carcinogen, benzo(a)pyrene, induced an 89% incidence in the same experiment. Although old Sprague-Dawley females are known to show a low, spontaneous mammary tumor incidence, Huggins and Yang found that an oral dose of 200 mg of a marginal carcinogen (benzo(a)anthracene) did not produce tumors. The results of this 1962 study establish TNF as a medium-potent mammary carcinogen in rats.

The in vivo toxicity data presented in the IBM follow-up submission of June 3, 1980, verify a TNF toxicity projection made in the initial EPA status report, i.e. carcinogenicity.

In May 1968, a 6-month inhalation study was initiated by IBM to test the carcinogenic potential of 2,4,7-trinitrofluorenone (TNF) and the TNF-polyvinyl carbazole charge-transfer complex (CTC) in mice. The study results indicate either a high normal incidence of lung tumors or a low degree of tumorigenicity for both tested materials. Because of the relatively short duration of the exposure and the use of only the mouse as the test species, this study does not provide an adequate basis to judge the carcinogenic or tumorigenic potential of TNF or CTC via inhalation exposure.

Another study was initiated by IBM in May 1968 to determine the carcinogenicity of TNF and CTC by repeated skin application to mice. The experimental procedure included 3 subcutaneous injections followed by application to the skin for 15 months. At the end of 6 months, there was a significant incidence of fibrosarcomas and unspecified tumors at the site of application of TNF and CTC. In addition, the TNF-treated mice had an increased incidence (25%) of tumors at a distant site (adenomas of the lung). It is significant that the positive control (2-acetylaminofluorene; 2-AAF) also increased the incidence of lung adenomas in the same experiment.

A second study on repeated skin application to mice was initiated by IBM in December 1969. This study differed from the previous study in that no injections of TNF or the CTC were made. The final report concludes that neither TNF nor CTC increased spontaneous tumor incidence. The positive control in this study, benzo(a)pyrene, was reported to produce gross and microscopic lesions which were consistent with the known carcinogenic actions of this compound. It is assumed that IBM was attempting to demonstrate that neither TNF nor CTC are absorbed through the skin and that the carcinogenic action of these compounds occurs only when they are injected subcutaneously. Although the results of this study are reported to be negative, the Agency believes that this study was inadequate and the results obtained do not remove the EPA's concern for the potential carcinogenicity of these chemicals. The Agency believes that the shortcomings of the 1969 IBM study are: 1) skin application was carried out for only 18 months; and 2) the dose of TNF applied may have been inadequate on a molar basis when compared to the doses of TNF which produced significant internal toxicity after application to the skin of rabbits (see c. Other Toxicity (In Vivo)). The TNF dose could also be considered inadequate on a molar basis with regard to TNF biotransformation to the hydroxamic acid form. It is suspected that only a small fraction of the absorbed trinitrofluorenone compound will follow this pathway. If in this series, it is the hydroxamic acid that is likely to be formed, the only acceptable TNF dose would be the maximum tolerated dose and the duration of application or administration would have to be 2 years. This would be necessary to meet the concept that no-effect doses do not apply to carcinogens. It would be helpful to have data on the metabolites of TNF and the pathways of excretion. It would also be helpful to have a pharmacokinetic study on TNF absorption and its sojourn in the body. In the absence of pharmacokinetic and biotransformation data on the CTC, the dose applied may have also been inadequate.

The possibility that workers and users of the subject electrophotographic copying/printing equipment could be exposed to TNF via the skin and inhalation is sufficent to warrant a study of the metabolism of this compound.

It should also be noted that the mouse may not be a truly appropriate species to confirm the mammary tumorigenicity of polynuclear hydrocarbon-type compounds. It is a well established phenomenon that a single oral administration of certain hydrocarbons induces mammary tumors predominantly in the rat. In addition, the ICR Swiss mouse strain, which is randomly bred, is not eminently suited for studying mammary tumor induction.

c. Other Toxicity (In Vivo)

Additional in vivo TNF toxicity data provided by IBM also verify several other toxicity projections made in the first EPA status report, i.e. skin sensitization and irritation.

In two separate IBM-sponsored studies, TNF was tested for skin sensitization using a modified Landsteiner technique in guinea pigs. The criterion used by the performing laboratory to determine sensitization was the comparison of the average skin response (i.e. the degree of irritation and the area of skin involvement) from nine (9) sensitizing injections with the average skin response following a challenge injection. The results from the studies showed that TNF was sensitizing to the skin of 2/8 animals in the first test, and 1/8 animals in the second test. The positive control 2,4-dinitro-1-chlorobenzene (DNCB), which is a known skin sensitizer, did not cause sensitization in any animals in either study. On a molar basis, TNF appears to be a more potent skin sensitizer than DNCB because the amount of TNF applied was 3-fold less than the amount of DNCB applied. The CTC, which was tested in only one of the performed studies, did not cause sensitization in any of the test animals. However, the negative sensitization response with CTC may not necessarily be valid in light of the failure of the positive control to produce sensitization in the study.

The results from other IBM-sponsored tests indicate that TNF is mildly irritating to rabbit skin and slightly irritating to rabbit eyes. The oral LD_{50} for TNF was found to be in excess of 21 g/kg in rats. The dermal LD_{50} was found to be in excess of 2 g/kg when applied to intact or abraded skin of rabbits. The principal toxic effects of TNF observed in this rabbit dermal application study were transient soft feces at the lower dose (.2 g/kg) and diarrhea and soft feces at the higher dose (2 g/kg). Although the laboratory report does not distinguish if these effects were observed in animals with intact or abraded skin, the results indicate that TNF may be absorbed through the skin, excreted in the bile, and exert an irritant action on intestinal mucous membranes.

The results from the above *in vivo* studies show that TNF is capable of producing both mucous membrane and skin irritation, and skin sensitization. The lack of an observed skin sensitization response for the CTC might have been due to either the injection of doses which were insufficient to exert such an effect and/or the TNF contained in the CTC is biologically unavailable to cause skin sensitization. The results also indicate that TNF can be absorbed through the skin as evidenced by the observed (and apparently dose-related) gastro-intestinal toxicity. In order to determine whether TNF is absorbed more efficiently through the skin than the g.i. tract, further studies would need to be undertaken. However, based on the data provided from the dermal versus oral LD_{50} studies, it appears that the toxicity of TNF absorbed through the skin may be greater than the toxicity of TNF absorbed through the gut.

Current Production and Use

A review of the production range (includes importation volumes) statistics for 2,4,7-trinitrofluorenone (CAS No. 129-79-3) which is listed in the initial TSCA Inventory has shown that no 1977 production/importation was reported or that all of the production range data reported was claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a)). **/

However, an estimate of the U.S. production of 2,4,7-trinitrofluorenone for the years 1974-1979 is provided below (U.S. International Trade Commission, 1976-1979):

Thousands of Pounds

1974	1975	1976	1977	1978	1979
N.R.	≥ 1	≥ 5	≥ 5	N.R.	N.A.

N.A. = Not Available
N.R. = Not Reported

2,4,7-Trinitrofluorenone is most probably produced in the United States by dry distillation of diphenic acid with calcium oxide to form 9-fluorenone, which is then nitrated (The Merck Index, 1976; Kirk-Othmer Encyclopedia of Chemical Technology, 1967).

2,4,7-Trinitrofluorenone is used as a component of charge-transfer complexes, to extend the spectral sensitivity of such complexes, which are used as the photoconductive coating in electrophotographic copiers, and as the photoconductive layer in photosensitive organic semiconductors and deformation recording films (e.g., videotape) (Kirk-Othmer Encyclopedia of Chemical Technology, 1978).

With regard to the use of TNF in electrophotographic copiers/printers, IBM reports that there are two (2) basic types of electrostatic copiers: DIRECT and TRANSFER. In the DIRECT process, an image is formed directly on a specially treated paper. In the TRANSFER process, the image is transferred to plain paper following the formation of the image on an intermediate substance.

The IBM Corporation reports that it markets the following four (4) models of photocopy machines which employ a TRANSFER process involving the use of TNF: the Model 3800 - IBM Printing Subsystem; the Model 3896 - IBM Tape-Document Converter; the Model 6800 - IBM Copier; and the Model 6801 - IBM Copier II. (IBM states that according to a published industry source (not cited), there were approximately 60,000 of these TNF-containing models in use as of the end of 1979).

In general, the electrostatic photocopy TRANSFER process involves the charging and exposure of a light-affected photoconductor (PC), the developing and transfer of the image, and the fusing of the image to the paper. It is the photoconductor (PC) which is reported to contain the charge-transfer complex (i.e. TNF and polyvinyl carbazole resin) embedded in an aluminized Mylar® flexible plastic sheet.

The following briefly summarizes the basic steps involved in the TRANSFER electrostatic photocopy process:

> Image Formation - A charge apparatus places a negative electrostatic charge on the PC surface where the image will be formed. This charge is dissipated wherever light strikes it. Exposure lamps reflect light from the original document

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**/ The data submitted for the TSCA Inventory including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

to the PC surface. Lighter areas of the document reflect light to the PC surface and dissipate the electrostatic charge. Darker areas of the document absorb light. The unlighted areas of the PC therefore remain charged and correspond to the printed areas of the document.

Image Development - The image is developed by bringing a carrier loaded with toner into contact with the PC. The toner consists of a finely powdered pigment and plastic resin. The carrier consists of plastic coated beads. When these two components are rubbed together, the toner becomes positively charged and the carrier becomes negatively charged. The carrier transports toner to the surface of the PC via a magnetic brush. Toner clings to the charged areas of the PC, forming a visible image.

Image Transfer and Fusion - The developed image is transferred from the PC to the paper by placing a strong negative charge on the back of the paper and bringing the paper into contact with PC. This causes the majority of the toner to be attracted away from the PC to make a copy. Heat from fuser lamps then melts the toner onto the paper, producing the photocopy product. The remaining toner is removed from the PC by a cleaning apparatus and is then deposited in a filter bag/cannister. It appears that this toner is not re-used in the photocopy process.

The IBM Corporation reports that in 98.5% of the TNF-containing copiers, the photoconductor (PC) film roll contains a maximum of 50 grams of TNF uniformly embedded throughout the coating, with 2-2.5% of the PC film being on the drum surface at any given time. This would amount to between 1-1.25 grams of TNF actually on the drum surface.

In the remaining 1.5% of the machines, IBM reports that the maximum amount of TNF in the total PC film roll is 511 grams, with 4.1% of that film being on the drum at any given time. Therefore, the amount of TNF on the drum surface, in this case, would be approximately 7 grams.

Per Agency's request, IBM provided an estimate of "worst-case" exposure to TNF during photocopying procedures. It should be noted that the following "worst-case" analyses reflect the possible exposure to TNF from those photocopy machines reported by IBM to contain a maximum of 511 grams of TNF.

1. IBM has determined (via neutron activaton of doped photoconductor) that "spent" toner contains an average of 129 ppm (w/w) of TNF. IBM reports that although TNF is present in "spent" toner, the virgin toner does not

contain any TNF. IBM should be requested to provide complete protocols and data from this analysis. In addition, IBM should be asked to provide its definitions of "doped photoconductor" and "spent toner."

2. Via a quantitative Ames test technique, IBM has found that an average of .04 micrograms of TNF is present per cubic meter of ambient air (8 hr. sample) at the operator position (i.e. breathing zone). The results from this analytical technique indicate that a mutagen has been detected in the ambient air near the photocopier. Complete protocols and data from this study should be requested.

3. The average amount of toner thermally bonded to one sheet of 8.5 x 11 inch plain paper (containing 1300 characters) is reported by IBM to be 20 milligrams. Therefore, the amount of TNF physically bound to the toner deposited on this typical printed page is approximately 2.6 micrograms. This calculation is based on the 129 ppm (w/w) of TNF in "spent" toner.

It is not clear from the submitted information whether the TNF contained in "spent toner" exists as such or as a bound component with the polyvinyl carbazole in the charge-transfer complex (CTC). In addition no information was provided relative to the nature of the binding of TNF or the CTC to the "spent" toner. IBM should be requested to provide this type of information, if available.

Comments/Recommendations

The Chemical Hazard Identification Branch (CHIB/AD) is preparing a Chemical Hazard Information Profile (CHIP) on TNF.

With regard to IBM's mutagenicity/carcinogenicity potency correlations (based upon the method Clive et al.; Mutation Research, 59:61-108, 1979), the EPA believes that certain points should be made. There is no disagreement with IBM's final interpretation of the potency calculations (i.e. TNF is a more potent bacterial mutagen than 4-NQO, while 4-NQO is more active in cultured mammalian cells). However, the Agency believes that the technique of potency estimation has not been sufficiently validated at this time to be used routinely. Further, it is not recommended that such calculations be used to estimate in vivo carcinogenic/mutagenic potency from in vitro test results, or to make comparative potency estimates between in vitro systems.

It is the Agency's preliminary determination with regard to the submitted in vitro results, that trinitrofluorenone is a direct-acting mutagen which induces gene mutations in both bacterial and mammalian cells in culture, and can cause an increase in sister chromatid exchanges in cultured Chinese hamster ovary cells. These mutagenic events can be shown in some instances to be dose-related. It should also be noted that the mutagenicity of TNF has been confirmed in a study which recently appeared in the published literature (Levin *et al*.; Mutation Research; 63, 1 (1979)). Based on the *in vitro* test data provided by IBM, TNF would be suspected of being a potential mutagen and/or carcinogen *in vivo*.

In addition, it is the Agency's preliminary determination that TNF was shown in laboratory animals to be both sensitizing (guinea pigs) and irritating to the skin (rabbits), and irritating to mucous membranes (rabbit eyes and intestines).

With regard to carcinogenicity, it is the Agency's preliminary determination that the studies in mice with TNF and CTC via inhalation or dermal application alone appear to be inadequate to assess the tumorigenic or carcinogenic potential of the two substances by those routes of exposure. However, thus far both TNF and CTC have demonstrated carcinogenic/tumorigenic potential in laboratory animals via oral administration (rats; TNF) and combined subcutaneous injection/dermal application (TNF and CTC; mice).

a) In order to better determine the nature and extent of any possible risks of injury to human health due to exposure to TNF as used in certain photocopying processes and equipment, the Agency should request that the IBM Corporation provide the following information:

    1) Definitions of "spent toner" and "doped photoconductor."

    2) Complete copies of any and all results from neutron activation studies performed by and for IBM to detect TNF in "spent toner." This information should include complete copies of the test protocols and data, and the date(s) of performance and receipt of results.

    3) Complete copies of any and all results from quantitative Ames tests performed by and for IBM to detect TNF in the ambient air surrounding electrophotographic copiers/printers. This information should also include complete copies of the test protocols and data, and the date(s) of performance and receipt of results.

4) Complete copies of the results from any and all additional studies performed by and for IBM which indicated the presence of TNF in any form in any media (e.g. toner, paper, air, etc.) other than in or on the photoconductor. This information should include complete copies of the test protocols and data, and the date(s) of performance and receipt of results.

5) The complete results including protocols and data, from any and all studies performed by and for IBM to determine the mutagenicity of the TNF-polyvinyl carbazole CTC and/or polyvinyl carbazole alone.

6) Any available information on the form(s) in which TNF and CTC exist as found in "spent toner", paper copies, and air. Is TNF found as such, or always in complex with other materials such as in the CTC? If complexed, under what physical/biological conditions can the complex disassociate to free TNF? If free TNF exists, what are its binding properties to "spent toner" and paper copies, and under what physical/biological conditions can the TNF be liberated? Do any machine functions/malfunctions have any effect on the release of TNF and/or CTC from the photoconductor? If so, what are those functions/malfunctions and what are the effects? These questions should be answered by IBM to the extent possible based on available information.

7) What is the fate of the "spent toner" which is cleaned from the PC and deposited in the filter bag/cannister? How and where are these "spent" materials routinely disposed?

b) The Chemical Hazard Identification Branch (CHIB/AD) will review all requested information, revise this status report as appropriate and recommend further assessment, if warranted.

c) The Agency should transmit copies of the IBM followup submission and EPA status reports to OSHA, NIOSH, CPSC, NCI, SAD/OPII, and ORD. The Industry Assistance Office (IAO/OPII) should transmit copies of the initial and followup EPA status reports to the manufacturer(s)/importer(s) of TNF listed in the master TSCA Inventory.

d) NIOSH and OSHA should be requested to review the available toxicity and exposure information on TNF and CTC and to recommend, if warranted, appropriate worker health and safety protection measures. The EPA should also offer to cooperate with those agencies in such efforts.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0480-0340S
Page 1 of 2

Approved JM 8/4/80

Revision Needed

DATE: AUG 4 1980

SUBJECT: Status Report* 8EHQ-0480-0340S

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch (TS-792)

TO: Joseph J. Merenda, Director
Assessment Division (TS-792)

Submission Description.

The Ciba-Geigy Corporation has reported summarized results from several in vivo and in vitro acute toxicity studies on Chimassorb 944. Although the actual chemical identity of this product was claimed confidential, the submitter stated that Chimassorb 944 is a high molecular weight hindered amine which is imported from Italy.

According to the summary provided, Chimassorb 944 has an acute (4-hour) inhalation LC_{50} of approximately .112 mg/liter when tested in Sprague-Dawley rats. The chemical was also reported to be an eye irritant in rabbits. This effect was reported to be non-reversible over a 14-day observation period. Although the test species were not specified, Chimassorb 944 was not found to be a skin sensitizer, but was found to be slightly irritating to skin. The result of an in vitro bacterial mutagenicity study (Ames test) was reported to be negative.

Submission Evaluation

The chemical structure and molecular weight of Chimassorb 944 place it in the class of potential histamine liberators. This class of chemicals produce their effect by degranulating mast cells. These granules contain heparin and histamine. The released histamine produces irritation or inflammatory phenomena. The release of heparin could result in bleeding. According to the submitter, a characterized Chimassorb 944 sample will be tested in order to rule out the possibility that impurities were responsible for the highly toxic action observed via inhalation.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Complete copies of the results from the cited in vivo and in vitro studies should be requested from the submitter.

Current Production and Use

Due to the fact that confidentiality has been claimed by the submitter for the exact chemical identity of Chimassorb 944, a review of the non-confidential TSCA Inventory (1977) importation/production range will not appear in this status report.**/

The submitter reports that Chimassorb 944 is a high molecular weight (approximately 3000), polymeric light stabilizer which is used to protect polymers from degradation, particularly polyolefins such as polypropylene fibers and tape, and low-density polyethylene and ethylene vinyl acetate films.

Comments/Recommendations

Ciba-Geigy Corporation states that the results from the planned toxicity studies on Chimassorb 944 will be forwarded to the EPA. However, as a consequence of the toxicity data provided in the present submission, the company reports that it is in the process of preparing an appropriate product warning label and is updating the Chimassorb 944 Material Safety Data Sheet. In addition, the submitter is notifying all Chimassorb 944 customers of the toxicity findings submitted to the EPA and the modified recommended handling precautions. The Ciba-Geigy Corporation also states that it is actively engaged in the development of a non-dusting granular form of Chimassorb 944. This is being done in order to minimize any potential problems in handling the product.

a) The Ciba-Geigy Corporation should be requested to provide complete copies of the results, including test protocols and data, from the studies cited in its submission.

b) The Chemical Hazard Identification Branch (CHIB/AD) will review the additional information requested and/or provided, revise this status report as appropriate, and recommend further follow-up assessment if warranted.

c) The Agency should transmit copies of this submission and status report to NIOSH, OSHA, and CPSC. The Industry Assistance Office (IAO/OPII) should consider sending the same materials to manufacturer(s)/importers(s) of the subject chemical listed in the master TSCA Inventory.

**/ The data submitted for the TSCA Inventory, including production/importation range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0580-0341
Page 1 of 2

DATE: JUN 17 1980

SUBJECT: Status Report* 8EHQ-0580-0341

Approved JM 6/17/80

Revision Needed ______

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch (TS-792)

TO: Joseph J. Merenda, Director
Assessment Division (TS-792)

Submission Description

The Union Carbide Corporation reports that several of its maintenance workers experienced urinary dysfunction symptoms (evidenced by bladder fullness, bladder pain, urgency, urinary frequency, and low urine output) following a cleanup of spilled propiophenone (CAS No. 93-55-0) at a production unit in South Charleston, West Virginia. The company reports that in all cases (2 male and 1 female) the urinary symptoms subsided after the employees were removed from the working area.

The submitting company believes that inhalation was the route of exposure during the clean-up as there was no ingestion of the chemical and the maintenance workers involved were wearing protective equipment (gloves, boots, etc.) to minimize skin contact. In addition, the company reports that it has manufactured propiophenone for five (5) years with no such effects found or complaints made by their workers.

Submission Evaluation

The changes in urinary function as described in the submission (urgency, frequency and small volume in addition to a feeling of fullness and pain) suggest, at first consideration, direct exposure of the groin area to the vapors of an irritant - in this case propiophenone. If the vapors were actually inhaled the symptoms would most likely be due to unmetabolized propiophenone excreted via the kidney. The irritation would affect the kidney proper, the ureters, bladder, and particularly the urethra. Irritants that affect the kidney proper usually cause loss of protein into the urine. Were the urines of the victims examined?

A more serious effect, though not likely in this case, would be due to the ability of propiophenone to affect bladder control through its action on the spinal cord. Phenones are known to act on the central nervous system. Acetophenone was used clinically to produce sleep in humans and benzophenone was used to treat epilepsy.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

A review of the production range (includes importation volumes) statistics for propiophenone (CAS No. 93-55-0) which is listed in the initial TSCA Inventory has shown that between 100 thousand and 1 million pounds of this chemical were reported as produced/imported in 1977.**/

Propiophenone (ethyl phenyl ketone) is used as a fixative in perfumes, a starting material for the synthesis of ephedrine and other pharmaceuticals and synthetic chemicals, and as a laboratory reagent.

Comments/Recommendations

Union Carbide reports that company employees, customers, and other concerned agencies including NIOSH, OSHA, and the ACGIH have been advised of this situation. In addition, Union Carbide states that studies will be initiated in order to determine whether the reported urinary effects can be demonstrated in the laboratory.

a) The submitting company should be requested to inform the Agency of the results obtained from the laboratory studies planned to further define the possible urinary system toxicity of propiophenone. The Agency should also request the results of urinalyses (if performed) on the exposed workers.

b) The Agency should transmit copies of the submission and status report to NIOSH, OSHA, and the ACGIH. In addition, the Industry Assistance Office (IAO/OPII) should consider sending the same information to the manufacturers/importers of propiophenone listed on the TSCA Inventory.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: JUL 1 1980

SUBJECT: Status Report* 8EHQ-0580-0342

Approved 7/3/80

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch (TS-792)

TO: Joseph J. Merenda, Director
Assessment Division (TS-792)

Submission Description

ASARCO, Inc. has reported that lung tumors have been observed in 15/17 rats chronically exposed via inhalation to 4.2 milligrams of antimony trioxide (CAS No. 1309-64-4) dust per cubic meter for six hours per day, five days a week for one year. The submitter reports that the animals at the low dose (1.6 mg per cubic meter) and the control animals did not develop lung tumors. Liver and mammary tumors were reported to have occurred in both the exposed and control groups.

The submitting company reports that while it is unaware of any prior information regarding the lung tumor effect of antimony trioxide, it finds the occurrence of those tumors in the high dose group puzzling. In addition, the submitter states that because of the extremely high doses used in the study, it is unclear as to the conclusions that can be drawn. ASARCO also states that it believes that humans are not likely to be exposed to doses as high as those used in the high dose group of study.

Submission Evaluation

Some researchers have suggested that a relationship exists between antimony (Sb) exposure and pulmonary carcinogenesis. This submission appears to be the first authentic report of such an activity. Although only two concentrations of antimony trioxide were tested (with the highest dose alone reported as producing tumors) the results establish that chemical as a carcinogen. It is unclear from the submitted information, however, when the lung tumors were first observed. Therefore, the duration of exposure and latency to tumor formation cannot be surmised.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

A review of the production range (includes importation volumes) statistics for antimony trioxide (CAS No. 1309-64-4) which is listed in the initial TSCA Inventory has shown that between 10 million and 108 million pounds of this chemical were produced/ imported in 1977.**/

The uses of antimony trioxide include the flameproofing of textiles, paper, and plastics (mainly polyvinyl chloride); paint pigments; ceramic opacifiers; catalysts; intermediates; copper and iron staining; phosphors; mordants; and glass decolorizers.

Comments/Recommendations

A contract report (hazard assessment) on antimony and antimony compounds was prepared in 1976 for the Agency (EPA 560/2-76-002). A dossier on antimony trioxide was prepared by a contractor for the TSCA Interagency Testing Committee in 1978 (Contract No. EQ8AC013). The National Institute for Occupational Safety and Health (NIOSH) has prepared a criteria document on a recommended standard for occupational exposure to antimony (September, 1978). NIOSH recently (August 1978) published a technical report on the environmental exposure to airborne contaminants in the antimony industry (DHEW (NIOSH) Publication No. 79-140).

The Test Rules Development Branch (TRDB/AD), in conjunction with the Environmental and Health Review Divisions, is currently reviewing data received by the EPA pertaining to antimony trioxide as designated by the Interagency Testing Committee (ITC).

a) ASARCO, Inc. should be requested to provide complete copies of the experimental results, including protocols and data, from the *in vivo* chronic inhalation studies on rats and swine cited in this submission. In addition, the submitter should be requested to provide the results of the chemical analysis (if performed) on the tested antimony trioxide.

b) The submitting company should also be requested to describe the actions it has taken in response to the submitted toxicity data to warn workers and customers and/or to eliminate or reduce exposure to the subject chemical.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

c) The Chemical Hazard Identification Branch (CHIB/AD) will review the additional information requested, revise this status report as appropriate, and recommend further follow-up assessment if warranted.

d) It is recommended that a priority Chemical Hazard Information Profile (CHIP) be prepared by CHIB/AD to include a discussion of these new toxicological data submitted on antimony trioxide.

e) The Agency should transmit copies of the submission and status report to NIOSH, OSHA, CPSC, NCI, ORD, and CAG. The Industry Assistance Office (IAO/OPII) should consider transmitting the same information to the producers/importers of antimony trioxide listed on the TSCA Inventory.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0580-0343
Page 1 of 2

DATE: AUG 25 1980

SUBJECT: Status Report* 8EHQ-0580-0343

Approved JM 9/3/80

Revision
Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Gulf Oil Exploration and Production Company reported an emergency incident of environmental contamination involving the release of hydrogen sulfide (CAS No. 7783-06-4) from a Gulf Oil Corporation-operated oil well in Dunn County, North Dakota. Due to the level of hydrogen sulfide detected near the well (100 ppm; maximum scale reading), Gulf employees quickly evacuated six occupants from two residences located 1/2 mile from the site.

After determining that the source of the hydrogen sulfide emission was the oil well, it was closed by Gulf employees. When the levels of hydrogen sulfide had declined to zero at the nearby homes, the residents were permitted to return. The company stated that no injuries had resulted from this incident.

In addition to the immediate on-site company actions, Gulf notified EPA's Region VIII Emergency Planning and Response Branch in Denver, Colorado.

Submission Evaluation

Hydrogen sulfide is a known toxic gas. A long exposure to concentrations as low as 5 ppm can lead to irritation of the eyes and airways. Exposure to concentrations of 100 ppm can lead to death within one hour. Because the hydrogen sulfide detector at the site recorded a concentration of at least 100 ppm, the company's immediate evacuation of the nearby residents appears to have been appropriate.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

Based on the nature of this submission, a review of production and uses of the subject chemical is not necessary.

Comments/Recommendations

Gulf reports that the actions taken by its employees were in accordance with its written Hydrogen Sulfide Contingency Plan for the Little Knife Field in which the incident occurred. The plan reportedly provides for procedures to be followed for protecting employees and other parties from hydrogen sulfide and also contains instructions on emergency evacuations.

a) The Agency should transmit a copy of this status report and submission to the EPA's Region VIII Office.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0680-0344P
Page 1 of 2

DATE: [redacted] 21 [redacted]

SUBJECT: Status Report *8EHQ-0680-0344P

Approved JM 7/21/80

Revision Needed

FROM: Frank D. Kover, Chief Justine Welch for
Chemical Hazard Identification Branch (TS-792)

TO: Joseph J. Merenda, Director
Assessment Division (TS-792)

Submission Description

Western Electric has reported that certain of its employees are experiencing "discomfort" (i.e. difficulty in breathing, headaches, and burning in the nose) apparently during the purging of ZYTEL® molding presses. The submitting company reports that ZYTEL® is a nylon resin with the CAS No. 63428-83-1 and the chemical formula $(C_6\text{-}H_{11}\text{-}N\text{-}O)n$.

Western Electric states that no information on any toxic or hazardous decomposition products associated with nylon resin could be found.

Submission Evaluation

Diamines could possibly be released during the heat purging of the nylon molding presses. Many diamines can cause the release of histamine from tissues or from the mast cells within tissues. Histamine causes constriction of the smooth muscle in the airways which would result in difficulty in breathing. Histamine dilates blood vessels, including those within the skull, which may cause the headaches. Histamine headache is a recognized clinical entity. The burning in the nose could be either a direct effect of a diamine or histamine release as occurs in colds and some allergies.

Current Production and Use

ZYTEL® is a trademark for nylon resins available as a molding powders, extrusion powders, and soluble resins.

Due to the nature the information contained in this submission, a review of the current production of the subject chemical does not appear to be necessary at this time.

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EPA FORM 1320-6 (REV. 3-76)

Comments/Recommendations

It is the Agency's preliminary determination that the acute toxicity information, as presented in this submission, did not warrant being reported under Section 8(e) of TSCA. The rationale for this preliminary determination is as follows:

> According to Part V of the March 16, 1978, "Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" (43 FR 11110), a substantial risk of injury to health is a risk of considerable concern because of (a) the seriousness of the effect... and (b) the fact or probability of its occurrence." With regard to the seriousness of the effect, the Agency considers the human health effects for which substantial risk information must be reported to include "any instance of cancer, birth defects, mutagenicity, death, or serious or prolonged incapacitation, including the loss of or inability to use a normal bodily function with a consequent relatively serious impairment of normal activities...." In addition, Part VI(2) further states that it is possible that effects less serious than those described above may be preliminary manifestations of those more serious effects and together with another triggering piece of information, constitute reportable information.

Therefore, because the human health effects, as reported in this submission, do not appear to be serious and did not produce a prolonged incapacitation or serious impairment of normal activities, the Agency believes that the provided acute human toxicity information, when considered alone, did not warrant reporting under section 8(e) of TSCA.

Western Electric states that it has urged its employees to report any further difficulties to the company's medical department. In addition, the submitting company states that its investigation of the reported situation will continue in order to determine the cause of the discomfort to its employees.

a) The Agency should transmit a copy of this status report and submission to OSHA and NIOSH.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0680-0345
Page 1 of 3

DATE: SEP 16 1980

SUBJECT: Status Report* 8EHQ-0680-0345

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Approved ____________

Revision Needed ____________

Submission Description

The SCM Corporation (Glidden Coatings and Resins Division) has reported the results from a water sample analysis from a pump-out well at a plant site in Charlotte, North Carolina. According to the submission, the plant's previous owner (Celanese Corporation prior to 1977), had constructed this well in order to collect seepage from an underground release of approximately 50,000 gallons of vinyl acetate. The submitter reports that this underground contamination, which had occurred in 1975, allegedly resulted after a hydrochloric acid spill corroded a transfer line connecting underground storage tanks of vinyl acetate. SCM also reports that Celansese indicated that this spill had been reported to local and state authorities and the EPA in 1975.

In addition, the SCM Corporation states that it (SCM) was cited in early 1979 by the local utility district for low pH effluents (pH not specified) from this plant site. As the problem was traced to the vinyl acetate spill pump-out well, Celanese was reported to have been notified of its continued responsibility for the vinyl acetate spill.

The SCM Corporation reports that a tentative agreement for remedying the low pH problem has been reached with the Celanese Corporation. The actions to be taken, which include continuous operation of the spill pump-out well and the addition of caustic, are designed to lower the effluent pH, decontaminate the soil, and confine the contaminated zone to the central area of the plant site. These actions would thereby prevent the possible spread of contaminated groundwater off site. The submitter also states that, in addition to the maintainance of pH records, the pump-out well and plant perimeter groundwater monitoring wells will be analyzed on a monthly basis for organic contaminants and the results forwarded to the North Carolina Department of Natural and Economic Resources. The results of the first chemical analysis of water from the pump-out well, provided by SCM in its submission, indicated the presence of 10 volatile organics and 13 heavy metals (see Table I. below). However, the submitter has raised questions concerning the validity of the sampling technique used (i.e., the water sample was apparently withdrawn from the pump-out well which had not been in operation for 9 months, and there was evidence of corrosion of the well's galvanized steel casing). The submitter believes that because this sampling technique did not allow for an adequate purge of the well contents, the heavy metal content detected may have been due to sedimentary corrosion products and not actual pump-out well discharge. The submitter states that the detected organics and metals currently appear on the EPA's list of 129 priority pollutants and that some of the detected substances are in excess of current Clean Water Standards.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

TABLE I. Results of Water Sample Analyses for Priority Pollutants

ORGANICS	PARTS PER BILLION (ppb)
benzene	7680
1,1-dichloroethane	23
1,2-trans-dichloroethylene	2295
ethylbenzene	24
methylene chloride	570
dichlorodifluoromethane	50
tetrachloroethylene	25
toluene	5200
trichloroethylene	50
vinyl chloride	130

METALS (and other pollutants)	PARTS PER MILLION (ppm)
Antimony	0.16
Arsenic	0.023
Beryllium	<0.01*
Cadmium	0.018
Chromium	1.90
Copper	1.28
Lead	0.45
Mercury	<0.001
Nickel	2.76
Selenium	<0.01*
Silver	<0.02*
Thallium	<0.1*
Zinc	82.5
Total Cyanide	2.65**
Total Phenol	0.10†

* Higher detection limit due to interferences.

** Distillate highly colored; cyanide level measured on original sample using ion-specific electrode.

† Interference suspected.

Submission Evaluation

Of obvious concern would be the potential for human, animal, and/or plant exposure to water containing organic and heavy metal pollutants, especially any found to be in excess of existing standards. With regard to the low (acid) pH detected in the effluents, there is a concern for potential harmful effects on aquatic and plant life.

The submitter attributes the heavy metal content of the analyzed water sample to a corrosive attack on the galvanized steel well casing. This would not, however, readily account for the detected chromium, lead, nickel, selenium, silver, thallium, and cyanide. It is also difficult to conceive the conditions whereby hydrochloric acid would react with vinyl acetate to yield benzene, 1,1-dichloroethane, methylene chloride, ethylbenzene, dichlorodifluoromethane, tetrachloroethylene, toluene, trichloroethylene, and 1,2-trans-dichloroethylene. The presence of these chemicals suggests another source of contamination.

Current Production and Use

Based on the nature of this submission, a review of the current production and uses of the subject chemicals is not necessary at this time.

Comments/Recommendations

The Chemical Hazard Identification Branch (CHIB/AD) has transmitted a copy of this submission to the EPA Region IV Office in Atlanta, Georgia for appropriate follow-up actions.

a) The Agency should transmit a copy of this status report to the Region IV Office for inclusion in its files on this reported groundwater contamination.

b) The Agency should also transmit copies of the submission and status report to OWWM for further EPA actions if warranted.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0680-0346
Page 1 of 3

DATE: JUL 1 1980

SUBJECT: Status Report* 8EHQ-0680-0346

Approved JM 7/1/80

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch (TS-792)

TO: Joseph J. Merenda, Director
Assessment Division (TS-792)

Submission Description

The Ethyl Corporation has reported the results of a subchronic rabbit dermal study on the zinc salt of 0,0,bis(1,3-dimethylbutyl)phosphorodithioic acid (CAS No. 2215-35-2). The submitter states that after "relatively large amounts" of the substance were applied to rabbit skin (five days per week for three consecutive weeks), microscopic examination of gonadal tissues showed a decrease in or absence of sperm in 3/6 male rabbits at the higher dose; 1/6 males in the lower dose group showed a slight decrease in spermatogenic activity. In addition 1/6 males at the higher dose reportedly exhibited testicular atrophy.

The Ethyl Corporation states that the above results were suprising in light of negative spermatogenic effects obtained from an earlier study (identical protocol) performed on the zinc salt of the compound which was esterified with a mixture of isobutanol and 2-ethylhexanol.

In addition, the submitter reports that as compounds of this type are known to be highly irritating and corrosive to the skin, "impervious gloves and facial protection are required" for workers handling the materials. The submitter believes, however, that inhalation of significant amounts of the chemical would be most unlikely due to its low vapor pressure.

Submission Evaluation

The important finding is that 0,0,bis(1,3-dimethylbutyl)phosphorodithioic acid was absorbed through the skin of male rabbits in sufficient amounts to cause effects in the testes. Similar application should be made to female rabbits to see if the ovaries are affected.

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The reported failure of the esterified mix with isobutanol and 2-ethyl-hexanol (the reaction gives rise to di-isobutyl, di-2-ethylhexyl and iso-butyl-2-ethylhexylesters) to produce testicular changes may have been due to inadequate water solubility to allow penetration of the skin.

Although these zinc salt compounds are not likely to have potent anti-cholinesterase action, in the absence of a more detailed description of the clinical and pathological effects in the rabbits it is not possible to rule out such action. What caused the stress reaction with its subsequent involution of lymphoid organs - skin necrosis or something else? What caused the pneumonitis? Were the testicular changes related to the stress reaction? Does not the stress (alarm) reaction produce changes in the adrenal cortex (particularly if lymphoid involution is still in progress)? Detailed toxicology data, including the LD_{50}, are needed.

Current Production and Use

A review of the production range (including importation volumes) statistics for the zinc salt of 0,0,bis(1,3-dimethylbutyl) phosphorodithioic acid (CAS. No. 2215-35-2) which is listed in the initial TSCA Inventory has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed (Section 14(a) of the TSCA, U.S.C. 2613 (a)).**/

The Ethyl Corporation reports that the subject chemical is manufactured in a closed system and is diluted with oil before transfer and shipment. The end-use of the compound is in lubricating oils (generally closed systems) at concentrations of less than 1%.

Comments/Recommendations

The Ethyl Corporation states that although it believes "that under the conditions of manufacture and use this material poses no threat to human health", it is notifying its customers and employees of the results of the performed studies. In addition, the company reports that additional testing will be undertaken in order to verify the observed adverse spermatogenic effects.

a) The Ethyl Corporation should be requested to provide the complete report, including test protocols and data, from the dermal study cited in this submission. In addition, the complete results from the planned additional toxicity testing should be requested from the submitter.

**/ The data submitted for the TSCA Inventory including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

b) The Chemical Hazard Identification Branch (CHIB/AD) will review the additional information requested, revise this status report as appropriate, and recommend further follow-up assessment if warranted.

c) The Agency should transmit copies of this submission and status report to NIOSH, OSHA, and CPSC. The Industry Assistance Office (IAO/OPII) should consider sending the same materials to manufacturer(s)/imports(s) of the subject chemical listed in the master TSCA Inventory.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: SEP 19 1980

SUBJECT: Status Report * 8EHQ-0680-0347

Approved

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Dow Corning Corporation has submitted the summarized preliminary results from a 28-day inhalation study of trimethoxysilane (CAS No. 2487-90-3) in male and female rats. Exposures to the chemical at chamber concentrations of 0.5, 5.0, and 10.0 parts per million were reportedly carried out for five (5) days per week, seven (7) hours per day for four (4) weeks. At the highest dose, 60% of the animals had died after 2-3 weeks of exposure. High dose exposure was terminated by the 21st day and the remaining rats sacrificed in order to provide clinical and pathological data. At the mid-dose, 40% of the animals had died by the end of the fourth week. Neither the control (air) group nor the low-dose group experienced any mortality in the experiment. The submitter reports that significant decreases in both food consumption and body weight, and general weakness with moderate to severe lung congestion were observed in the high and mid-dose animals of both sexes. Significant deviations from control values were also found in hematological parameters (males and females; mid and high dose) and blood biochemical parameters (females; high dose). Subacute to chronic bronchitis and bronchiolitis were observed in all rats (male and female) exposed to trimethoxysilane at 5 and 10 ppm; similar lesions were reportedly not found in the 0.5 ppm dose group or in the control group.

In addition to submitting the summarized experimental results described above, Dow Corning also provided a summary of the acute toxicological properties of trimethoxysilane. According to the data provided, trimethoxysilane has acute LD$_{50}$s of 9.33 ml/kg (oral; rats) and 6.3 ml/kg (dermal; rabbits) and a 4-hr LC$_{50}$ of approximately 125 ppm (inhalation; rats). The chemical is also reported to be moderately irritating to rabbit eyes and slightly irritating to rabbit skin.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

With regard to human health, the submitter reports that trimethoxysilane should be handled with great care and that information available to the company indicates that health incidents due to exposure to this chemical have been rare and of a minor nature. The submitter also states that no adverse health effects due to the chemical have been observed at Dow Corning.

Submission Evaluation

Trimethoxysilane may be considered to be an analog of tetraethylsilicate, which is known to produce capillary hemorrhages in the lungs, regardless of the route of administration. Similar changes occurred in the rats exposed to trimethoxysilane vapors. The observed bronchiolitis is reminiscent of delayed phosgene poisoning.

It is also of interest to note that the LD_{50} via dermal application to rabbits is 2/3 of that by oral administration to rats. It may be that following oral dosing, the stomach (via acid hydrolysis) and the liver (via esterase and etherase activities) metabolize this chemical, which would make less unaltered compound available for systemic effects.

Current Production and Use

A review of the production range (includes importation volumes) statistics for trimethoxysilane (CAS. No. 2487-90-3), which is listed in the initial TSCA Inventory, has shown that between 0 and 1000 pounds of this chemical were reported as produced/imported in 1977.**/

Although no specific use information on trimethoxysilane was located in the secondary literature sources consulted, silanes in general, have been used to make water repellant textiles and paper, and are the source of hyperpure silicon for use in semiconductors.

Comments/Recommendations

The Dow Corning Corporation has reported that it is informing all other manufacturers of organosilicon chemicals of these toxicological findings on trimethoxysilane.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

The EPA has recently received and evaluated other TSCA Section 8(e) submissions on silicon chemicals (8EHQ-0680-0349 and 8EHQ-0780-0354).

a) The Chemical Hazard Identification Branch/AD should review the additional information (i.e. final reports) which the submitter has stated will be forwarded to the EPA, revise this status report as appropriate, and recommend further followup assessment if warranted.

b) The Agency should transmit copies of this submission and status report to OSHA and NIOSH. The Industry Assistance Office (IAO/OTS) should consider sending the same materials to the manufacturer(s)/importer(s) of trimethoxysilane listed in the master TSCA Inventory.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0680-0348
Page 1 of 4

DATE: SEP 18 1980

SUBJECT: Status Report* 8EHQ-0680-0348

Approved ________

Revision Needed ________

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

Amchem Products, Inc. has reported that certain chemical products sold under the brand name Rodine® (Rodine® 50, 51, 85, 95, 96, and 500) have been analyzed and found to contain residual amounts (i.e. less than 0.5% by weight) of ortho-toluidine (CAS No. 95-53-4). The methods(s) used for these analyses was not specified by the submitter.

The submitter reports that the above listed Rodine® products are made from a Rodine Base which is an intermediate prepared from an ortho-toluidine starting material. According to the analytical data provided by the submitter, the Rodine Base, which comprises less than 50% by weight of the final formulated Rodine® products, contains approximately 0.62% by weight (6200 ppm) ortho-toluidine. Amchem states that the analyses of these products were prompted by a report that an Italian company (which manufactures and distributes Rodine® products under license from Amchem) had been ordered to discontinue the sale of Rodine® products which utilize ortho-toluidine as an ingredient.

The submitter states that during the time its Rodine® products have been manufactured and sold (more than 40 years), the company has not received any reports of significant injury to health or the environment resulting from use of these products. The submitting company also provided technical data sheets for the Rodine® products listed above.

Submission Evaluation

O-toluidine can be absorbed through the lungs, skin and g.i. tract and can cause methemoglobinemia, anemia, liver injury, kidney injury and skin irritations. In addition, substituted anilines, such as o-toluidine, are usually more potent carcinogens than is aniline.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Although earlier studies of the carcinogenicity of o-toluidine have had flaws, a recent National Cancer Institute carcinogenicity study does not have such flaws and clearly demonstrates that o-toluidine is a potent and versatile carcinogen.

The NCI bioassay of o-toluidine hydrochloride was conducted by administering the test chemical in feed to F344 rats and B6C3F1 mice. Groups of 50 rats of each sex and 50 mice of each sex were administered o-toluidine hydrochloride at one of several doses, either 3,000 or 6,000 ppm for the rats and either 1,000 or 3,000 ppm for the mice, for 101 to 104 weeks. Matched controls consisted of 20 untreated rats of each sex and 20 untreated mice of each sex. All surviving rats and mice were killed at the end of administration of the test chemical. Mean body weights of dosed male and female rats and mice were lower than those of corresponding matched controls and were dose related. Mortalities of the male and female rats were dose related and were relatively high at the end of the bioassay. Mortalities of the male and female mice were not, however, significantly affected by administration of the test chemical.

In rats, the administration of the test chemical induced several types of sarcomas of the spleen and other organs in both males and females, i.e. mesotheliomas of the abdominal cavity or scrotum in males, and transitional-cell carcinomas of the urinary bladder in females. Administration of the o- toluidine hydrochloride also resulted in increased incidences of fibromas of the subcutaneous tissues in the males and fibroadenomas or adenomas of the mammary glands in the females.

In mice, hemangiosarcomas were induced at various sites in the males, and hepatocellular carcinomas or adenomas were induced in the females.

Current Production and Use

The submitter reports that the total amount of distributed Rodine® products which may contain residual ortho-toluidine, was less than 1 million pounds in 1979. The company also reports that the 1980 figures are not expected to exceed those for 1979.

According to the technical data sheets provided, these Rodine® products (i.e., Rodine® 50,51,85,95,96, and 500) are used at various dilutions as acid inhibitors in metal treatment (e.g. pickling).

A review of the production range (includes importation volumes) statistics for ortho-toluidine (CAS. No. 95-53-4), which is listed in the initial TSCA Inventory, has shown that between 1 million and 10 million pounds of this chemical were produced/imported in 1977.**/

Comments/Recommendation

Amchem Products, Inc. reports that it is reviewing this situation involving the presence of residual ortho-toluidine in certain of its Rodine® products, and will take appropriate actions.

In 1974, OSHA set the current occupational standard for ortho-toluidine exposure at an 8-hour time-weighted average (TWA) of 5 ppm in air (39 CFR 23540). An evaluation of the carcinogenic risk of ortho-toluidine exposure to man has been prepared by the International Agency for Research on Cancer (IARC Monograph, Vol. 16, 1978). A working draft dossier on ortho-toluidine was prepared by a contractor on March 2, 1979, for the Interagency Testing Committee (ITC).

Based on the results of its recent bioassay of ortho-toluidine hydrochloride, the National Cancer Institute (1979) has concluded that:

> "Under the conditions of this bioassay, o-toluidine hydrochloride was carcinogenic in both male and female F344 rats and B6C3F1 mice, producing a significant increased incidence of one or more types of neoplasms." (DHEW Publication No. (NIH) 79-1709)

a) Amchem Products, Inc. should be requested to describe those actions it states will be taken in response to the detection of o-toluidine in certain of its Rodine® products. The company should also be requested to describe the actions it takes to warn workers and customers, and to reduce and/or eliminate the exposure to o-toluidine in the subject products.

b) In this particular case, Amchem's direct submission of this section 8(e) information to the Assistant Administrator's Office (OPTS) did not unduly burden the EPA's processing of the notice. However, it should be brought to the submitter's attention that the substantial risk information reporting requirements (Part IX of the March 16, 1978, "Statement of Interpretation and Enforcement

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**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Policy; Notification of Substantial Risk" (43 FR 11110)) clearly specify that TSCA section 8(e) notices are to be sent directly to the Document Control Officer, Management Support Division, Office of Pesticides and Toxic Substances (WH-557), Environmental Protection Agency, 401 M Street S.W., Washington, D.C. 20460. A copy of the EPA's March 16, 1978, policy statement should be sent to the submitter.

c) It is recommended that a Chemical Hazard Information Profile (CHIP) on ortho-toluidine be considered for preparation.

d) The Agency should transmit a copy of this submission and status report to NIOSH, OSHA, and CPSC.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0680-0349
Page 1 of 3

Approved

Revision
Needed

DATE: SEP 19 1980

SUBJECT: Status Report *8EHQ-0680-0349

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Union Carbide Corporation has reported the summarized results from several acute toxicity tests on Silicone Y-6607 which was reported for the TSCA Inventory as "Siloxanes and Silicones, dimethyl, di(methylamino) terminated" (CAS No. 67762-92-9). The submitter states that although "nothing remarkable or unusual" was found during routine acute animal toxicity range finding tests (oral; dermal; skin and eye irritation), the results from subsequent short-term inhalation studies in rats showed an unexpected level of toxicity.

The submitter reports that all test animals (6 rats per group) died following timed exposures to "substantially saturated vapors" of Silicone Y-6607 for periods of 195 seconds, 6.5 minutes, 13 minutes, or 26 minutes. At the shorter intervals, some or all of the animals died between 1 to 6 days after their removal from the exposure condition. An exposure for 97 seconds resulted in the death of 50% of the test animals after exposure was terminated. A 49 second exposure did not result in any deaths, although toxic effects were reportedly observed. The submitter states that the data from this inhalation study allows the calculation of a median lethal time (Lt_{50}) of 98 seconds in "substantially saturated vapors" of Silicone Y-6607.

The submitter also reports that a 4-hour inhalation LC_{50} of 774 parts per million was determined from a metered vapor concentration study of Silicone Y-6607 in rats.

Union Carbide states that lung damage was observed in the rats which died during both short-term inhalation studies. In addition, the submitter reports that eye opacities were found in the animals exposed to "substantially saturated vapors" of Silicone Y-6607.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

In providing these data, the Union Carbide Corporation states that it has "no basis at present to suggest a mechanism regarding the observed lethal effects, nor even to conclude that effects are due directly to the chemical itself as opposed to conversion products derived from the chemical. From evaluation of the foregoing tests results, it is the conclusion of Union Carbide's toxicologists that exposure to moderately high concentrations of this chemical appears to present two hazards: namely, damage to the respiratory tract leading to potentially lethal asphyxsia and moderately severe eye irritation. Further, prolonged exposure to saturated vapors may be fatal, either immediately or subsequent to exposure; shorter periods of exposure may initiate toxic effects in the lungs which become progressive and ultimately fatal."

Submission Evaluation

The Silicone Y-6607 product (dimethyl-, di(methylamino)-terminated siloxanes and silicones) probably contains sufficient amounts of low molecular weight components to yield (upon hydrolysis) dimethylamine and finely divided dimethyl siloxane diols. Low molecular weight compounds which contain the Si-N linkage are not stable in aqueous environments, including the lungs and eyes. The observed eye opacities in the exposed rats suggest the presence of dimethylamine. Dimethylamine, like ammonia, is a severe eye and upper respiratory tract irritant. Such irritant action would also account for the acute rat deaths observed during the 6.5 minute exposure to the "substantially saturated vapors." Such deaths can be caused by cardiovascular and respiratory inhibitory reflexes. In humans, the operation of such reflexes for more than 60-80 seconds usually results in death. If the exposure is less severe (as in the 90 second chemical exposure to rats) recovery occurs but extensive damage to the trachea, bronchi, bronchioles and the lungs may develop and would result in bronchitis, bronchiolitis, and pneumonia after several days (as was seen in the rats in 2-5 days following exposure). The toxicity reportedly observed but not described for the rats exposed to the saturated Silicone Y-6607 vapors for 49 seconds, also suggests the presence of an irritant.

Current Production and Use

A review of the production range (includes importation volumes) statistics for CAS. No. 67762-92-9 (dimethyl-, di(methylamino)-terminated silicones and siloxanes) which is listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a)). **/

With the exception of one unspecified external use, the submitter reports that Silicone Y-6607 is used as an intermediate in the manufacture of other chemicals within the Union Carbide Corporation. No other information on the uses of this product was located in the secondary literature sources consulted.

Comments/Recommendations

The Union Carbide Corporation states that the completed final reports of the inhalation studies will be provided to the EPA. In addition, the submitting company reports that all persons potentially exposed to Silicone Y-6607 are being advised of this toxicity information submitted to EPA under TSCA Section 8(e). The company also reports that its workers are being advised of safety and health protection measures to be implemented in the event of spills or releases of Silicone Y-6607.

The EPA has recently received and evaluated other Section 8(e) submissions on silicon chemicals (8EHQ-0680-0347 and 8EHQ-0780-0354).

a) The Chemical Hazard Identification Branch (CHIB/AD) will review the final reports from the cited studies when received, revise this status report as appropriate, and recommend further followup assessment if warranted.

b) The EPA should transmit copies of this submission and status report to OSHA and NIOSH. The Industry Assistance Office (IAO/OTS) should consider transmitting the same materials to all manufacturer(s)/importer(s) listed in the master TSCA Inventory.

**/ The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0780-0350
Page 1 of 3

DATE: NOV 13 1980

SUBJECT: Status Report* 8EHQ-0780-0350

Approved JM 11/18/80

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Procter and Gamble Company has provided the complete results from a battery of mutagenicity tests on Acid Green 3 (CAS No. 4680-78-8). The submitter reported that although the results from an in vivo cytogenetics test in rats were negative, Acid Green 3 was demonstrated to be mutagenic in an in vitro mouse lymphoma cell assay. The results from an in vitro bacterial cell mutagenicity assay (Ames test) were reported to be equivocal. Procter and Gamble also provided copies of several scientific papers published between 1953 and 1966, which implicated Acid Green 3 as a suspect animal carcinogen.

In evaluating the potential risk presented by the commercial use of this dye, Procter and Gamble has reportedly taken the position that "if a chemical can cause mutagenic response in animals or living cells, and that exposure of unknown magnitude to humans and the environment occurs, the information could be viewed as subject to 8(e) reporting." However, the submitter also states that the provided information "does not allow a firm conclusion that Acid Green 3 presents a substantial risk to man...."

Submission Evalution

Acid Green 3 was tested in the Ames Salmonella/microsomal assay using strains TA1535, TA1537, TA1538, TA98 and TA100 both with and without metabolic activation (liver enzyme prepared from rats pretreated with Aroclor 1254). The results obtained with all strains without metabolic activation were reported to be uniformly negative. In addition, the results with strains TA1537, TA1538, TA98, and TA100 with metabolic activation were negative. When tested with strain TA1535 with metabolic activation, Acid Green 3 produced neither a clearly negative nor a clearly positive response. The Agency agrees with the submitter's overall interpretation that the results obtained from this in vitro test system with Acid Green 3 were equivocal.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Acid Green 3 was also tested for in vitro mutagenicity in Mouse Lymphoma L5178Y cells. The assay was performed both with and without enzyme activation by an S-9 preparation from the livers of male rats pretreated with Arocolor 1254. The EPA agrees with the submitter's interpretation of the provided data. Acid Green 3 was shown to be mutagenic for L5178Y cells when tested without enzyme activation; no activity was observed in the presence of metabolic activation.

Acid Green 3 was tested for its ability to induce chromosomal aberrations in the bone marrow of male and female albino rats. The test material was administered by gavage once daily for 5 days. At the end of the treatment period, the animals were sacrificed and slides prepared from femoral bone marrow were stained with Giemsa stain. The slides were then analyzed for chromosomal abnormalities such as deletions, exchanges, rings, gaps and breaks. The submitter concluded that Acid Green 3 did not induce chromosome aberrations in the femoral bone marrow of treated rats. Based on a review of the experimental data provided, the EPA agrees.

The Agency believes that the following overall statements can be made about the mutagenicity test data submitted by Procter and Gamble on Acid Green 3:

1. Acid Green 3 is a direct-acting mutagen which causes point (gene) mutations in L5178Y mouse lymphoma cells in culture. It is inactive in this same system when tested with enzyme activation.

2. Acid Green 3 is at most marginally active in strain TA1535 when tested with enzyme activation in the Ames Salmonella/microsomal assay. Strain TA1535 is reverted by agents which cause base-pair mutations in the DNA.

3. Acid Green 3 does not cause chromosomal aberrations in rat femoral bone marrow after five days of treatment. No other conclusions about its mutagenic potential can be drawn from this study.

With regard to the carcinogenicity of Acid Green 3, the International Agency for Research on Cancer (IARC) has reviewed and evaluated data which demonstrated this chemical to be carcinogenic in rats, producing hepatic tumors after oral administration, local sarcomas following subcutaneous injection, and benign mammary tumors after continual (100 weeks) fur/skin contact with the dye powder (IARC Monograph, Vol. 16, 1978).

Current Production and Use

A review of the production range (includes importation volumes) statistics for Acid Green 3 (CAS No. 4680-78-8) which is listed in the initial TSCA Inventory, has shown that between 1000 and 10,000 pounds of this chemical were reported as produced/imported in 1977. **/

The Procter and Gamble Company reports that it is using Acid Green 3 in an unspecified experimental product which may have possible future commercial purposes. Acid Green 3 has been used as a food coloring, in pigments, in paper, wood, wool, silk, and leather dyes, and as a biological stain and indicator. It should be noted, however, that in late 1966, the use of Acid Green 3 as a colorant in foods, drugs, and cosmetics was forbidden by the U.S. Food and Drug Administration (FDA).

Comments/Recommendations

In its development work, the Procter and Gamble Company reports that it "has treated Acid Green 3 as a suspect carcinogen and has severely restricted exposure to the chemical on the basis of this assumption."

a) The Procter and Gamble Company should be requested to describe the actions it has taken to warn workers and others, and to reduce, "severely restrict", and/or eliminate exposure to Acid Green 3.

b) Acid Green 3 is listed on the EPA's proposed TSCA Section 8(a) Level A rule (45 FR 13646).

c) The Chemical Hazard Identification Branch (CHIB/AD) will transmit copies of this status report to NIOSH, OSHA, CPSC, FDA, NCI, and OWWM/EPA.

d) The Industry Assistance Office (IAO/OTS) should consider sending copies of the status report to the manufacturer(s)/importer(s) of Acid Green 3 listed in the Master TSCA Inventory.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0780-0351
8EHQ-0880-0351 Supplement
Page 1 of 3

DATE: OCT 20 1980

SUBJECT: Status Report *8EHQ-0780-0351
8EHQ-0880-0351 Supplement

Approved 10/28/80

Revision
Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

In its initial submission, the A. B. Dick Company reported that two of its electrophotographic copying toners (#62-2000 manufactured by DeSoto Inc. and #62-6100 manufactured by Agfa-Gevaert of Belgium) were found to be mutagenic in the Ames *Salmonella* (bacteria) test. The submitter reported, however, that due to manufacturing process changes made by DeSoto Inc., the mutagenic activity of that particular toner had been eliminated. A. B. Dick also reported that Agfa-Gevaert had obtained results of Ames tests which showed that its toner was negative for mutagenicity. The submitter stated that the results of Agfa-Gavaert's tests were requested for review and will be forwarded to the EPA.

In the supplemental submission, the A. B. Dick Company provided the complete results of the Ames tests performed with the modified-process DeSoto toner.

Submission Evaluation

In the initial submission, DeSoto toner (#62-2000) was reported to be mutagenic for *S. typhimurium* strains TA1537 and TA98 without metabolic activation and for strain TA1537 with metabolic activation. Agfa-Gevaert toner (#62-6100) was reported to be mutagenic for strains TA1537, TA1538 and TA98, both with and without metabolic activation. In addition, DeSoto toner (#62-2000) induced a dose-related increase in the number of mutants with strain TA98 with metabolic activation and with strain TA100 without metabolic activation. However, the absolute increase in the number of induced mutants was less than 3x the control value with strain TA98 and less than 3.5x the control value with strain TA100. Therefore, this toner was not considered by the performing laboratory to be mutagenic for strain TA98 with metabolic activation or for strain TA100 without metabolic activation. Agfa-Gevaert toner (#62-6100) also produced an increase in the number of induced mutants in strain TA100 both with and without metabolic activation, but was not considered by the performing laboratory to be mutagenic because the number of induced mutants was less than 3.5x the number of mutants in the control. In addition, nine (9) other A. B. Dick Company toners were tested and reported to be non-mutagenic.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Based on a review of the provided in vitro data, the EPA believes that the results as reported in the initial submission were correct. DeSoto toner (#62-2000) was mutagenic for S. typhimurium strain TA1537 both with and without metabolic activation and for strain TA98 without metabolic activation. In addition, Agfa-Gevaert toner (#62-6100) was mutagenic for S. typhimurium strains TA1537, TA1538 and TA98 both with and without metabolic activation. The results obtained with DeSoto toner (#62-2000) in strain TA98 with metabolic activation and strain TA100 without metabolic activation, and Agfa-Gevaert toner (#62-6100) in strain TA100 both with and without metabolic activation are equivocal. In addition, the nine (9) other tested A. B. Dick toners were, as reported, without activity in the Salmonella/ microsome system.

According to data provided by the A. B. Dick Company in the supplemental submission, DeSoto's modified-process toner (#968X334) was tested for mutagenic activity with S. typhimurium strains TA1535, TA1537, TA1538, TA98 and TA100. Toner #968X334 was reported to be nonmutagenic for those bacterial strains when tested both with and without metabolic activation.

Based on a review of the data provided in the supplemental submission, the EPA believes that the results are correct. Modified-process DeSoto toner #968X334 was, as reported, without activity in the Salmonella/Microsomal Assay for bacterial mutagenicity.

Current Production and Use

No information on the production volumes of the subject electrophotographic copying toners was provided by the submitter or located in the secondary literature sources consulted.

Comments/Recommendaitons

It is the A. B. Dick Company's stated opinion is that their toners pose no health hazard to persons operating or servicing A. B. Dick equipment using these toners under normal conditions. The submitter reported that both DeSoto Inc. and Agfa-Gaevert were advised of the original findings of in vitro mutagenicity. Based on those initial findings, A. B. Dick informed DeSoto Inc. that no additional toner product would be accepted until such time as scientific evidence verifying the elimination of the mutagenic element was received by the A.B. Dick Company.

The EPA is currently reviewing scientific data obtained (FYI-0480-0070) from the Xerox Corporation relating to similar *in vitro* findings and other *in vivo* toxicities of Xerox toners and toner materials. The EPA has also received information from the University of Texas Medical Branch, Galveston, Texas (Connor, 1980, unpublished data) concerning the mutagenic and cell transforming activities (*in vitro*) of organic solvent extracts of a photocopying toner.

NIOSH (DHEW, 1978) has published a Criteria Document which addresses the recommended standard for the the occupational exposure to carbon black.

The Chemical Hazard Identification Branch (CHIB/AD) is currently updating its Chemical Hazard Information Profile (CHIP) on carbon black to include a discussion of these new and other related data.

The EPA has requested the Occupational Safety and Health Administration (OSHA) and the Natonal Institute for Occupational Safety and Health (NIOSH) to review and evaluate the information obtained by the EPA concerning carbon black and electrophotographic toners and toner materials, and to recommend, if warranted, appropriate worker safety and health protection measures. The EPA has agreed to cooperate with NIOSH and OSHA in such efforts.

a) The Chemical Hazard Identification Branch/AD will transmit copies of this status report to NIOSH, OSHA, CPSC, NCI, FDA, OANR/EPA, OWWM/EPA, and ORD/EPA.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: SEP 16 1980

SUBJECT: Status Report* 8EHQ-0780-0352

Approved ____________

Revision Needed ____________

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Montgomery Elevator Company has reported that certain elevators are powered by hydraulic systems which may contain polychlorinated biphenyls(PCB)-contaminated fluids. This report was prompted by the detection of 67 ppm PCBs in the hydraulic fluids of an elevator located in the Food and Drug Administration offices in Minneapolis, Minnesota. The subject elevator was manufactured by, but no longer owned by the submitting company. The submitter believes that the detected PCBs are the result of the elevator owner's use of a product called Wynn's Friction-Proofing Fluid. The submitting company believes that although this product was removed from the market in 1971, residual amounts of the material may still remain in use.

The submitter also believes that because this type of hydraulic powered elevator is typically found in small businesses and apartment buildings, the owners may not be fully aware of the possible presence of PCBs in such systems, and in addition, may be unaware of the EPA's current and proposed rules on PCBs.

Submission Evaluation

PCBs are among the most stable chemicals known. Once released into the environment, they decompose very slowly over a period of several decades. Due to this stability, they remain in the environment and are taken up and accumulated in fatty tissues. This accumulation in organisms is significant because PCBs are hazardous to health at extremely low levels. Specifically, PCBs have been shown to cause chronic toxic effects in many species at less than 10 parts per million (ppm). There are well documented tests on laboratory animals which show that PCBs can cause reproductive failures, gastric disorders, skin lesions, tumors, and other effects of concern.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

In man, PCBs can enter the body through the lungs, the gastrointestinal tract, and the skin. After absorption, PCBs are circulated in the blood throughout the body and are stored in fatty tissue and a variety of organs, including the liver, kidneys, lungs, adrenal glands, brain, heart, and skin.

The submitter's finding of 67 ppm PCBs in an elevator hydraulic fluid does indicate the opportunity for human exposure during routine servicing and possibly during operation.

Current Production and Use

Polychlorinated biphenyls (PCBs; CAS No. 1336-36-3) are members of a broad family of organic chemicals known as chlorinated hydrocarbons. Although PCBs may be produced naturally in the environment, almost all PCBs in existence today have been synthetically manufactured.

Primary uses of PCBs were, and continue to be, electrical transformer cooling liquids and capacitor dielectric fluids. Most of the PCBs marketed in the United States are still in service in these applications. However, PCBs have also been used in a variety of other applications such as heat transfer systems and hydraulic fluids; dye carriers in carbonless copy paper; plasticizers in paints, adhesives, and caulking compounds; fillers in investment casting wax; and as dust control agents, sealants, and coatings on roads.

PCBs have heavy oil-like consistencies, have high boiling points, and weigh approximately 10-12 pounds per gallon. Other important properties include: a high degree of chemical stability, low solubility in water, high solubility in fat, low flammability, and low electrical conductivity. These physical/chemical properties have made PCBs commercially attractive.

Legislative and Regulatory Actions on PCBs

A report by the President's Council on Environmental Quality in May 1972, recommended that Congress enact the Toxic Substances Control Act (TSCA) to provide regulatory authority required to deal with PCBs and other chemicals. Before the passage of the Toxic Substances Control Act, EPA could only regulate facilities that discharged PCBs into navigable waterways. On July 23, 1976 (41 FR 30468), EPA proposed to ban the discharge of PCBs into waterways by electrical transformer and capacitor manufacturers. The final rule (42 FR 6532) was promulgated under Section 307(a) of the Federal Water Pollution Control Act on February 2, 1977.

At the time the Toxic Substances Control Act was passed (1976), there was widespread recognition and concern regarding the serious, adverse effects PCBs have on the environment and human health. Congress responded to this problem by including a special section in TSCA, Section 6(e), prohibiting future manufacturing, processing, distribution in commerce, and use of PCBs and providing for adequate marking and disposal of the PCBs still in use.

Since then, EPA has implemented the provisions under Section 6(e) of TSCA. The following is a summary of these actions:

On February 17, 1978, EPA promulgated the PCB Marking and Disposal Rule (40 CFR 761). In this rule, EPA established specific requirements for the marking and disposal of PCBs according to the nature and concentration of the PCBs in question.

On May 31, 1979, EPA promulgated the PCBs Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions (PCB Ban Rule) (40 CFR 761). Specifically, this rule:

1) Prohibits all manufacturing of PCBs after July 2, 1979, unless specifically exempted by EPA;

2) Prohibits the processing, distribution in commerce, and use of PCBs, except in a totally enclosed manner after July 2, 1979, unless specifically authorized by EPA;

3) Authorizes certain processing, distribution in commerce, and use of PCBs in a non-totally enclosed manner;

4) Prohibits all processing and distribution in commerce of PCBs after July 1, 1979, unless specifically exempted by EPA.

It should be noted that the regulatory scheme developed in the PCB Marking and Disposal Rule and the PCB Ban Rule was designed to minimize exposure to humans and the environment while allowing the continued use of those PCBs which are totally enclosed or have been granted authorizations or exemptions. "Totally enclosed manner" was defined by Congress in TSCA to mean a manner which will ensure no significant exposure of human beings or the environment to PCBs, as determined by EPA by rule (Section 6(e)(2)(C)). The final ban rule provides that human or environmental exposure to any detectable quantities of PCBs shall be deemed significant.

The use of intact, non-leaking PCB transformers, PCB-contaminated tranformers, electromagnets, and PCB capacitors and equipment containing such capacitors is considered a "totally enclosed" activity. However, servicing of such equipment is not considered a totally enclosed activity.

Congress provided a mechanism to allow exceptions to the statutory ban of non-totally enclosed activities (Section 6(e)) by permitting EPA to authorize some activities which are not totally enclosed. In order to authorize an activity, EPA must find that continuation of the activity does not present an unreasonable risk of injury to human health or to the environment.

Exceptions may also be made to the manufacturing ban or to the ban on PCB processing and distribution in commerce. TSCA referred to these exceptions as "exemptions" (Section 6(e)(3)(B)). Before an exemption can be granted, there must be a determination that an unreasonable risk is not present and that good faith efforts have been made to develop substitutes for the PCBs.

The following non-totally enclosed activities have been granted authorizations until July 1, 1984: the servicing of PCB-containing transformers; the use of PCBs in heat transfer systems; the use of PCBs in hydraulic systems; the servicing of PCB electromagnets; the use of small quantities of PCBs for research and development; and the use of PCBs as a microscopy mounting medium. The use of PCBs in natural gas pipeline compressors was authorized until May 1, 1980. Authorizations until January 1, 1982, have been granted for the use of PCBs in mining equipment, the servicing of mining equipment, and the use of PCBs in pigments. Finally, due to the significant quantities of carbonless copy paper that contain small amounts of PCBs in government, industry, and personal files, the rule authorizes continued maintenance of such paper.

On May 9, 1980, the EPA, the Food and Drug Administration and the Department of Agriculture, jointly published a proposed rule which would ban the use of PCBs (including PCB use in hydraulic systems) in facilities producing and/or storing agricultural chemicals, food, feed, and food packaging (45 FR 30980).

Comments/Recommendations

Although PCBs remain in use, EPA carefully considers the circumstances and conditions of each remaining use. Most of the remaining PCBs are in totally enclosed electrical equipment which will be replaced in the next few years as this equipment is serviced or retired. Most importantly, EPA has strict servicing, storage and disposal requirements to protect against escape of the PCBs into the environment. Further, authorization of each remaining use will continue to be reviewed on a regular basis to ensure that they do not present an unreasonable risk to human health and the environment.

a) The Agency should transmit copies of this submission and status report to the PCB Team/CAD/OCC for appropriate followup attention.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0780-0353
Page 1 of 3

DATE: OCT 15 1980

SUBJECT: Status Report* 8EHQ-0780-0353

Approved 10/15/80

Revision
Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Standard Oil Company (SOHIO) has provided the interim results of a lifetime mouse skin-painting study of two grades of an aromatic petroleum pitch (CAS No. 68187-58-6) which is derived from an intermediate clarified oil solvent extract (CAS No. 64741-62-4). According to the provided summary, aromatic petroleum pitch Grade 170 and Grade 290 were shown by the 59th week of the study to be comparable in tumorigenic potential to that of the positive control (benzo(a) pyrene). The submitter reports that histopathological confirmation of the grossly diagnosed lesions has not been completed by the performing laboratory, but will be provided upon completion to the EPA. The submitter also reports that the results obtained "are corroborative of the generally known oncogenic activity of polynuclear aromatic hydrocarbons". The submitter states that the uses of this product and the methods of handling do not result in substantial exposure under conditions which would make the polynuclear hydrocarbons bioavailable.

Submission Evaluation

The average time for appearance of papillomas was approximately the same for both grades of the aromatic petroleum pitch as that observed for benzo(a)pyrene. The percent malignant and benign tumors based on number of starting animals was 90% for benzo(a)pyrene, 60% for Grade 170(a) (75% if the inadvertanly killed animals are deducted), 90% for Grade 170(b) and 80% for Grade 290. Further evaluation of the potency of these grades would require a quantitative analysis for known carcinogenic polynuclear aromatic hydrocarbons.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Although it may be true that the experimental application of the test materials dissolved in toluene made them more bioavailable than would occur under normal conditions of use, the possibility exists for the pitch to dissolve, to some extent, in oily sweat allowing some of the material to penetrate the pilosebaceous glands. In addition, it would be of interest to know if the uses of aromatic petroleum pitch (e.g. in foundry molds) results in vaporization or dust generation giving rise to inhalation exposure.

Current Production and Use

According to the TSCA Inventory, aromatic petroleum pitch is the residue from the distillation of thermal cracked residuum and/or catalytic cracked clarified oil with a softening point of 40°C to 180°C. It is composed primarily of a complex combination of three or more membered condensed ring aromatic hydrocarbons.

A review of production range (includes importation volumes) statistics for aromatic petroleum pitch (CAS No. 68187-58-6) which is listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14 (a) of the TSCA, U.S.C. 2613 (a)). **/

The submitter reports that aromatic petroleum pitch is used as an impregnant in cellulose fiber drainpipe and as a binder in the manufacture of foundry molds and molded skeet targets. The submitter also reports that aromatic petroleum pitch is a preferred alternative to coal tar pitch in its applications.

Comments/Recommendations

The Agency has previously evaluated a TSCA Section 8(e) submission (8EHQ-1078-0253) from the Standard Oil Company (SOHIO) concerning the carcinogenic activity (lifetime mouse skin-painting study) of the intermediate clarified oil solvent extract starting material (CAS No. 64741-62-4).

a) The Standard Oil Company (SOHIO) should be requested to provide the EPA with complete copies of subsequent interim reports and the final report from this lifetime mouse skin-painting study of aromatic petroleum pitch. The submitting company should also be requested to describe the actions it has taken in light of the reported toxicity data to warn workers, customers, and other producers, and to reduce and/or eliminate exposure to aromatic petroleum pitch.

**/ The data submitted for the TSCA Inventory including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

b) The Chemical Hazard Idenitification Branch (CHIB/AD will transmit copies of this status report to OSHA, NIOSH, CPSC, and DOE. The Industry Assistance Office (IAO/OTS) should consider sending the same information to the manufacturer(s)/importer(s) of aromatic petroleum pitch listed in the master TSCA Inventory.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0780-0354
Page 1 of 3

DATE: NOV 12 1980

SUBJECT: Status Report* 8EHQ-0780-0354

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Approved JM 11/12/80

Revision Needed ____

Submission Description

MCB Manufacturing Chemists, Inc. submitted a recently obtained copy of results from a subchronic in vivo study of silica gel (CAS No. 63231-67-4) and quartz (crystalline silica; CAS No. 14808-60-7) dusts. This study, which was reported to have been performed in Germany in 1967, involved intratracheal and intraperitoneal injections of the test materials in rats. According to the submitter, the results show that silica gel did not cause silicosis, but may have caused a chronic inflamed reaction in the test animals.

Submission Evaluation

It is well known that pulmonary exposure to quartz dust particles of proper size can result in silicosis. This is confirmed in the submitted study. In addition, silica gel has long been known to be absorbed from the intestines and other membranes and excreted rapidly via the kidneys. The study submitted by MCB highlights the fact that silica gel dust particles of proper size can elicit the granulomatous and other pathological reactions of silicaceous materials. However, there is a difference between the submitter's conclusion regarding silicosis and the conclusions presented by the performing laboratory pathologist. According to the statements of the performing laboratory pathologist, "...the microscopic analysis and the determination of the organ weights after intratrachea and intraperitoneum injections of quartz dust and silica gel dust [make] the differences between silica gel dust injection and quartz injection fairly meaningless." The reconciliation of the differing conclusions would require an indepth histopathological evaluation of the slides from the 1967 study and/or more definitive toxicological testing.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

A review of the production range (includes importation volumes) statistics for silica gel (CAS No. 63231-67-4), which is listed in the initial TSCA Inventory, has shown that no 1977 production/ importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a). **/

Silica gel is a jelly-like precipitate obtained when sodium silicate is acidified. Silica gel is used as a dehumidifying and drying agent. It can also be used in the recovery of natural gasoline from natural gas, the bleaching of petroleum oils, as a catalyst and catalyst carrier, as an anticaking ingredient in pharmaceuticals and cosmetics, and as a chromatographic agent.

A review of the production range (includes importation volumes) statistics for crystalline silica (CAS No. 14808-60-7) which is listed in the initial TSCA Inventory, has shown that between 10 million and 50 million pounds of this chemical was reported as produced/imported in 1977. This production range information does not include any production/impotation data claimed by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. **/

Silica (silicon dioxide) occurs widely in nature as sand, quartz, flint, and diatomite. It is used in the manufacture of glass, water glass, ceramics, and abrasives. Silica is also used in water filtration systems and as a component in hydraulic cements, anticaking agent in foods, flatting agent in paints, filler in cosmetics, pharmaceuticals, paper, and insecticides.

Comments/Recommendations

The National Institute for Occupational Safety and Health (NIOSH) has prepared a "Criteria Document" which addresses the recommended standard for occupational exposure to Crystalline Silica (DHEW Publication No. 75-120 (NIOSH, 1974)).

The EPA has recently received and evaluated other TSCA section 8(e) submissions on silicon chemicals (8EHQ-0680-0347 and 8EHQ-0680-0349).

a) MCB Manufacturing Chemists, Inc. should be requested to provide the basis for its contention that silica gel dust did not cause silicosis. In addition, the submitter should be

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**/ The data submitted for the TSCA Inventory, including production range infomation, are subject to the limitations contained in the Inventory Reporting Regulations (40 CRF 710).

requested to describe the actions it has taken, in light of the provided toxicity information, to warn workers and customers, and to reduce and/or eliminate exposure to the subject chemicals.

b) The Chemical Hazard Identification Branch (CHIB/AD) will coordinate with NIOSH the need for further evaluation of the submitted toxicity data on silica gel and quartz dusts. In addition, CHIB will transmit copies of this status report to OSHA, NIOSH, CPSC, FDA, and OWWM/EPA. The Industry Assistance Office (IAO/OTS) should consider sending the same information to the manufacturer(s) and importer(s) of the subject chemicals listed in the Master TSCA Inventory.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0880-0355
Page 1 of 3

Approved JM 11/12/80

Revision Needed

DATE: NOV 12 1980

SUBJECT: Status Report* 8EHQ-0880-0355

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

Allied Chemical has reported that several of its employees, working with methylthioacetaldehyde oxime (MTAAO; CAS No. 10533-67-2), had developed red splotches on the face and upper trunk, headaches, and tachycardia following alcoholic beverage consumption. The corporate physicians reported that the affected employees do not appear to have any long-lasting adverse health effects and that clinical laboratory findings are normal. The submitter states that although the cause of these symptoms is not known for certain, the workers' exposure to MTAAO or its equilibrium decomposition products is suspected. The submitter also states that the symptoms in the subject workers resemble those observed following alcohol consumption by individuals being treated with the anti-alcoholism drug Antabuse® (tetraethylthiuram disulfide).

According to literature references obtained by Allied, the following chemicals can produce symptoms similar to those described above following alcohol consumption: n-butyraldoxime, 2-pyridine aldoxime, methyl chloride, metronidazole (Flagyl^{R}), tolazamide, chlorpropamide, and certain chlorinated hydrocarbons.

Submission Evaluation

Many organic sulfur compounds inhibit the enzyme that oxidizes acetaldehyde to acetic acid. The first step in oxidizing alcohol in the body is the conversion to acetaldehyde. Therefore, ingestion of alcohol during the presence of one of these sulfur compounds will cause a piling up of acetaldehyde in the body. This excess causes symptoms and signs related to heart, blood vessels, respiration, liver function and nervous system function. The symptoms reported by Allied Chemical could be explained by accumulation of acetaldehyde following alcohol consumption.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

It should be noted however, that not all of the compounds listed by Allied produce reactions to alcohol by this same mechanism. For instance, chlorpropamide may do so by releasing prostaglandins in genetically susceptible individuals. The listed oximes are largely weak anticholinesterases that are capable of displacing stronger ones from the enzymes. It would be interesting to dose appropriate test animals with MTAAO and then measure blood levels of acetaldehyde after administering alcohol. One could also administer prostaglandin synthetase inhibitors (aspirin, indomethacin) to animals exposed to MTAAO and alcohol in order to determine whether the oxime produces its effects by the same mechanism as chlorpropamide. Information gathered by such studies could be life-saving for the occasional person who has an extreme reaction to the double exposure.

Current Production and Use

A review of the production range (includes importation volumes) statistics for MTAAO (CAS No. 10533-67-2) which is listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14(a) of TSCA, U.S.C. 2613 (a)).**/

The submitter states that MTAAO is not a particularly high volume chemical and is not widely used. No information on the use(s) of MTAAO was provided by the submitter or was located in the secondary literature sources consulted.

Comments/Recommendations

Allied Chemical states that it is advising the two other companies known to produce or use MTAAO of both the toxicological findings and Allied's actions. These reported company actions include a review of the MTAAO production process and a revision of the handling procedures in order to minimize employee exposure to the chemical. MTAAO product labels and product hazard communications are being reviewed by Allied in order to minimize potential transportation problems. In addition, Allied reports that it will continue its comprehensive medical surveillance program for all employees involved in MTAAO operations and has urged all employees to immediately report symptoms for prompt medical observation. These medical-related actions are part of the submitter's efforts to identify the specific causative factor.

**/ The data submitted for the TSCA Inventory including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

a) MTAAO is listed in the EPA's proposed TSCA Section 8(a) Level A rule (45 FR 13646).

b) The Chemical Hazard Identification Branch/AD will transmit copies of this status report to NIOSH and OSHA.

c) The Industry Assistance Office (IAO/OTS) should consider sending the same information to the manufacturer(s) and importer(s) of MTAAO listed in the master TSCA Inventory.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: DEC - 4 [illegible]

SUBJECT: Status Report* 8EHQ-0880-0356
8EHQ-0880-0357
8EHQ-1080-0356/7 Supplements

Approved 12/5/80

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

In two seperate initial submissions, the Nalco Chemical Company reported that preliminary results from a 13-week intraperitoneal injection study (rats) of 2-hydroxyethylacrylate (CAS No. 818-61-1; 8EHQ-0880-0356) and methylene bis acrylamide (CAS No. 110-26-9; 8EHQ-0880-0357) indicated that both compounds have neurotoxic properties. The initial submissions were based on preliminary histopathologic examination of tissues which were reported to show peripheral nerve damage. The submitter stated that these toxicological findings were reported for 2-hydroxyethylacrylate because it was the first indication (known to the company) that the chemical had neurotoxic properties. With regard to its methylene bis acrylamide submission, Nalco stated that the obtained results were in direct contrast to the published literature which indicates that this compound is non-neurotoxic.

In its supplemental submissions (8EHQ-1080-0356/7 Supplements), Nalco provided the final report, including test protocols and data, from the study which involved daily (5 days per week for 13 weeks) intraperitoneal injections of acrylamide (positive control; known neurotoxic agent), 2-hydroxyethylacrylate, methylene bis acrylamide, or a mixture of the latter two compounds. According to the summary prepared by the performing laboratory, no deaths occurred in the study. However, dose-related clinical symptoms such as salivation, lacrimation, hunch-back position, tip-toe walking, body tremors, piloerection, and weakening of the hind legs were reported for the animals receiving the highest doses (50 mg/kg) of either 2-hydroxyethylacrylate or methylene bis acrylamide. The performing laboratory reported that some, but not all, of the above clinical signs suggestive of neurotoxicity were observed in the animals receiving lower doses of the two compounds. The toxicity of the mixture was reported to be minimal, with only a few "incidence" of lacrimation observed.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

With regard to body weight, the highest doses (50 mg/kg) of 2-hydroxyethylacrylate or methylene bis acrylamide were reported to have caused a reduction in growth of the test animals. However, the magnitude of reduction was greater in those animals receiving methylene bis acrylamide. The mixture of the two compounds at 50 mg/kg was reported to have no apparent effect on the rate of growth. Food consumption was reported to be considerably less in the animals receiving 50 mg/kg doses of 2-hydroxyethylacrylate or methylene bis acrylamide. Little adverse effect on food consumption was observed at the lower doses of the two or in the rats receiving 50 mg/kg of the mixture.

Histopathologic examination of the tissues from all treated animals (including the acrylamide group) reportedly showed varying degrees of peripheral nerve damage. According to the performing laboratory, the extent of the nerve damage appeared to be more compound-related than strictly dose-related. The 50 mg/kg dose of the 2-hydroxyethylacrylate/methylene bis acrylamide mixture was reported to have caused more pronounced overall damage than the acrylamide control at a dose of 10 mg/kg. The degenerative changes induced in the peripheral nerve tissues by the individual compounds were reported to be less severe than those found in the acrylamide treated animals.

Submission Evaluation

The acrylamide derivative (methylene bis acrylamide) and the acrylate ester (2-hydroxyethylacrylate) both produced peripheral neuropathy in the experiment. This neuropathy resembles that produced by acrylamide. Both compounds were less toxic (less potent) than the acrylamide under the conditions of the experiment and for the nerve tracts that were examined histologically by the performing laboratory. The reason for the decreased food consumption and the resultant weight loss at the 50 mg/kg doses of methylene bis acrylamide or 2-hydroxyethylacrylate is not readily apparent. It may have been due to lack of appetite due to general malaise and/or an inability to reach and handle food caused by the neuropathy. The dosing schedule was inadequate to determine this.

Although no quantification for the severity of the lesions was provided, there appears to be a dose-related incidence of neurotoxicity for both methylene bis acrylamide and 2-hydroxyethylacrylate. Considering that the two compounds are not equally potent in toxicity, it is therefore not surprising that a mixture of the two is not as potent as either component.

Methylene bis acrylamide is an N-substituted acrylamide. The size and nature of the substituent would not greatly (qualitatively) alter the action of the parent acrylamide. It is therefore not surprising that the bis compound is also a neurotoxic agent.

The observation that 2-hydroxyethylacrylate causes the type of peripheral neuropathy heretofore considered characteristic of acrylamide is important. It establishes that the amide group ($-NH_2$) is not essential for the neurotoxic effect of acrylamide ($CH_2=CH-C(=O)-NH_2$). The fact that in the 2-hydroxyethylacrylate ($CH_2=CH-C(=O)-O-CH_2-OH$), the 2-hydroxyethyl group can replace the $-NH_2$ group suggests that other compounds with $CH_2=CH-C(=O)-$ may also produce peripheral neuropathy.

Current Production and Use

A review of the production range (includes importation volumes) statistics for 2-hydroxyethylacrylate (CAS No. 818-61-1) and methylene bis acrylamide (CAS No. 110-26-9), which are listed in the initial TSCA Inventory, has shown that no 1977 production/ importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a)). **/

The Nalco Chemical Company reported in its initial submissions that it has manufactured small quantities of methylene bis acrylamide and processed small quantities of 2-hydroxyethylacrylate at a facility in Chicago, Illinois.

2-Hydroxyethylacrylate is a functional monomer used in the manufacture of thermosetting acrylic resins. Methylene bis acrylamide is used as a chemical intermediate and as a cross-linking agent.

Comments/Recommendations

In the cover letters to its supplemental submissions, the Nalco Chemical Company stated that "as a result of this testing and other factors, Nalco has decided to drop [its] activities" with both methylene bis acrylamide and 2-hydroxyethylacrylate for the particular uses it had planned.

a) The Chemical Hazard Identification Branch will request the Nalco Chemical Company to describe additional actions it has taken, in light of the submitted toxicity data, to warn workers and others, and to reduce and/or eliminate exposure to the subject chemicals.

b) 2-Hydroxyethylacrylate is listed in the EPA's February 29, 1980 proposed TSCA Section 8(a) Level A rule (45 FR 13646). Methylene bis acrylamide should also be considered for inclusion in Section 8(a) Level A reporting.

**/ The data submitted for the TSCA Inventory including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

c) The Chemical Hazard Identification Branch will provide a copy of the initial and supplemental submissions on methylene bis acrylamide to the Test Rules Development Branch/AD which is reviewing data obtained by the EPA on acrylamide as recommended by the Interagency Testing Committee (ITC).

d) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, NCI/NTP, OWWM/EPA, and TRDB/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for distribution to EPA Regional Offices, State agencies, and to labor, environmental, and selected citizen groups. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and importers of the subject chemicals as listed in the Master TSCA Inventory, and to identified industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 5

DATE: FEB 25 1981

SUBJECT: Status Report* 8EHQ-0880-0358
8EHQ-0980-0358 Followup Response
8EHQ-1080-0358 Supplement

Approved JM 3/4/81

Revision Needed

FROM:
Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO:
Joseph J. Merenda, Director
Assessment Division

Submission Description

An employee of E. I. DuPont de Nemours and Company, Inc. has submitted a TSCA Section 8(e) notice concerning a possible hazard posed by DuPont's ferric chloride, which the employee believes to contain significant levels of radioactivity. The employee reported that the DuPont ferric chloride, which is produced and sold as a coagulant for use in water treatment facilities, is a by-product from a titanium dioxide manufacturing process using ilmenite ore as a starting material. The employee also reported that the ilmenite ores contain small amounts of radioactive substances which are subsequently concentrated in the ferric chloride. As part of the employee's duties in preparing Material Safety Data Sheets, the employee reported that attempts were made to gather additional information from DuPont on this chemical. The employee stated that DuPont "denied" the requests for data and reportedly told the employee that the information concerned "a highly sensitive subject." The employee stated that although he had "no further information, DuPont's sensitivity about this matter suggests that the ferric chloride solution introduces significant amounts of radioactivity into drinking water supplies, and that DuPont wishes to withhold this information from water treatment customers who buy and use ferric chloride solution and who are responsible for compliance with EPA drinking water standards."

It should also be noted that the employee made a claim of employer discrimination and requested protection as provided for under Section 23 of TSCA. In light of this request, the EPA forwarded a copy of the initial submission directly to the U.S. Department of Labor which has responsibility for implementing TSCA Section 23.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

In order for the EPA to determine the nature and extent of any health hazards posed by such radioactivity, the Agency requested (letter dated September 1, 1980) that E. I. DuPont de Nemours and Company, Inc. address and respond to the following questions:

1. Does DuPont's ferric chloride and/or ferric chloride solution contain radioactive isotopes?

2. If such isotopes are present, what are their specific chemical identities and in what chemical form do they exist? What is the actual source of these radioactive isotopes? What is the fate of these isotopes upon the end-use of ferric chloride in drinking water treatment? What percent of the radioactivity is precipitated during drinking water treatment? What percent remains in any form in ferric chloride-treated drinking water?

3. What are the maximum/minimum levels of the isotopes detectable per mass of ferric chloride? What analytical methods are used in that detection? What are the sensitivities and/or lower limits of detection of such analytical methods?

The Agency also requested that DuPont provide complete copies of all analytical protocols and existing data, of which DuPont was aware, that related to the above questions concerning ferric chloride.

In its response to the above questions (8EHQ-0980-0358 Followup Response), Dupont reported that 15% of its ferric chloride solution is sold for use in the treatment of drinking water (i.e. to flocculate and precipitate impurities). DuPont also reported that its ferric chloride solution does contain "low levels of naturally occurring radioactive isotopes of the thorium and uranium series." However, DuPont considers that radioactivity "to be at a low and safe level." DuPont stated its belief that the radioactive isotopes present in the ferric chloride solution are in the form of metal chlorides of the thorium and uranium series. DuPont also believes that the source of these isotopes is the ilmenite ores used in the manufacture of titanium dioxide pigments. DuPont stated that these naturally occurring radioactive "impurities are chlorinated with the ilmenite ore (TiO_2-FeO or TiO_2-Fe_2O_3) during titanium dioxide production and leave the process with the ferric chloride [by-product]."

With regard to the fate of the isotopes in the treated drinking water, DuPont reported that the isotopes are precipitated with the ferric ion and, as such, are separated from the water supply and become a sludge component. DuPont also reported that the results of sampling customers' drinking water supplies "indicate that the [$FeCl_3$] water meets the standards for radioactivity established by EPA under the Safe Drinking Water Act (40 CFR Sec. 141.15)."

In response to the EPA questions relating to the maximum/minimum levels of the isotopes detectable per mass of ferric chloride, DuPont provided the following information:

> "Du Pont's ferric chloride solution contains 20-60 pCi/gm gross α, 2-5 pCi/gm ^{228}Ra and 1-4 pCi/gm ^{226}Ra. A typical potable surface water supply on the East Coast contains a raw input of 1-2 pCi/l gross α, 0.5 pCi/l ^{288}Ra and 0.5-1.0 pCi/l ^{226}Ra. A typical $FeCl_3$ dose used in treating water would be 15 ppm which in the case of Du Pont $FeCl_3$ would contribute 1-3 pCi/l gross α, 0.1-.3 pCi/l ^{228}Ra and 0.05-0.2 pCi/l ^{226}Ra. These requirements are near or below the sensitivity limits (1 pCi/l gross α, 1 pCi/l ^{228}Ra and 0.3 pCi/l ^{226}Ra) using EPA-recommended test procedures."

DuPont stated that the above findings were confirmed in actual tests performed in Philadelphia (Pa.), Wilmington (Del.), Richmond (Va.), and Washington, D.C.

DuPont also reported that the EPA's Region II Office was informed (by telephone) on May 1, 1978, of the presence of radioactive isotopes in DuPont's waste ferric chloride solution and the levels of radiation in the raw and processed materials. This DuPont action was reportedly taken in light of the company's barging of waste ferric chloride.

The EPA has also received additional information (8EHQ-1080-0358 Supplement) from the employee who had submitted the original Section 8(e) notice. The employee expressed concern with regard to the DuPont followup response statement that "a typical $FeCl_3$ dose would be 15 ppm and would contribute 1-3 pCi/l gross α" or, as the employee stated "7-20% of the EPA drinking water standard of 15 pCi/l." The employee reported that "Fifteen ppm (approximately 15 mg/l) is at the low end of the dose range for $FeCl_3$ according to DuPont's Ferric Chloride Dose Chart. The graph gives addition rates to 140 mg/l (approximately 140 ppm), which would contribute 9-28 pCi/l, or 65-187% of the EPA drinking water limit." A copy of the subject dose chart was provided by the employee.

Submission Evaluation

The evaluation of these submissions has been performed by the Office of Drinking Water (ODW) of the Office of Water and Waste Management (OWWM/EPA).

The Office of Drinking Water is now developing a program which will specify purity of direct additives (treatment chemicals) to drinking water in order to assure that no risk to public health will be involved. This program is centered around the development, by the National Academy of Sciences, of a drinking water treatment chemicals "codex", analogous to their Food Chemicals Codex. The matter of radionuclide contamination of ferric chloride, brought to the EPA's attention under TSCA

Section 8(e), has been referred to the Academy for inclusion in their study of coagulants and flocculants, as well as development of an across-the-board policy on the contamination of direct additives by radionuclides. However, in the opinion of the Office of Drinking Water, the situation described in this case does not indicate an imminent threat to public health. The Agency will rely on the monitoring requirements of the Safe Drinking Water Act to assure that the maximum contaminant levels (MCLs) for radionuclides are not exceeded. When the direct additives program is implemented, this opinion, and others issued by the Office of Drinking Water will be subject to review based on the recommendations of the Academy and on the procedures and criteria developed by the Office of Drinking Water to deal with such situations.

Current Production and Use

A review of the production range (includes importation volumes) statistics for ferric chloride (CAS No. 7705-08-0), which is listed in the initial TSCA Inventory, has shown that between 62 million and 173 million pounds of this chemical were produced/imported in 1977. **/

As stated previously in this status report, ferric chloride is used to precipitate impurities in drinking water supplies. DuPont reports that 15% of its ferric chloride is sold for this purpose. The company did not provide any information on the use(s) of the remaining 85%. According to secondary literature sources consulted, ferric chloride is used in the dye industry and as a styptic.

Comments/Recommendations

With regard to its employee's original TSCA Section 8(e) notice on ferric chloride, DuPont stated that the original submission "should not be treated as a report under Section 8(e), but rather as an allegation of a possible adverse health or environmental effect." DuPont also stated that the employee did "not have sufficient information which reasonably supports the conclusion that the ferric chloride presents a substantial risk of injury to health or the environment as required for a matter to fall within the provisions of Section 8(e)."

Following review and evaluation of the provided information, the EPA believes that the DuPont employee did not have sufficient information which would provide reasonable support for a conclusion of substantial

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory Reporting Regulations (40 CFR 710).

risk of injury to health or the environment as defined in the EPA's March 16, 1978 "Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" (43 FR 11110). The employee's concerns appear to have been based on a lack of, and/or inability to obtain, information about a company product. It is important to note that the March 16, 1978 policy statement (Appendix B; EPA Response to Comment 7) provides that Section 8(e) "applies to information which a person possesses or of which he knows" which reasonably supports a conclusion of substantial risk. The tone of the employee's statement (i.e. [without] "further information, [the company's] sensitivity suggests. . .") indicates that the employee did not possess, or have actual knowledge of, information which reasonably supports a conclusion that DuPont's ferric chloride, as used in treatment of drinking water, poses a substantial risk of injury to health. Therefore, it is the Agency's preliminary determination that the information contained in 8EHQ-0880-0358 et seq. did not warrant submission to the EPA pursuant to Section 8(e) of the Toxic Substances Control Act.

a) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, DOL, OWWM/EPA, OANR/EPA, the submitting employee, and to DuPont. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OTS/EPA) for distribution to EPA Regional Offices and State agencies, and to labor, environmental, and selected citizen groups.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 2

DATE: FEB 25 1981

SUBJECT: Status Report* 8EHQ-0980-0359
8EHQ-0181-0359 Supplement

Approved 3/24/81

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

In its initial submission, the FMC Corporation provided summarized results from several *in vitro* mutagenicity and *in vivo* acute toxicity studies on diallyl tetrabromophthalate (DATBP; CAS No. 49693-09-6). The submitter reported that DATBP was recently found to be positive in an *in vitro* Yeast Mitotic Gene Conversion assay and weakly positive in an *in vitro* Mouse Lymphoma Forward Gene Mutation assay. The submitter reported, however, that a previous test for *in vitro* mutagenicity (Ames test performed in 1978) had demonstrated that DATBP was not mutagenic in bacteria in the presence or absence of metabolic activation. The submitter also reported that previously performed (1978) acute toxicity studies had shown that DATBP was not corrosive or irritating to the skin or eyes of rabbits. In addition, the LD_{50}s for DATBP were reported to be in excess of 5 g/kg (oral; rats) and in excess of 2 g/kg (dermal; rabbits). FMC Corporation pointed out that the recently performed Yeast Mitotic Gene Conversion assay for primary DNA damage and the Mouse Lymphoma Forward Gene Mutation Assay were both performed with a DATBP sample which had been synthesized by a different route than the sample of DATBP used in the studies done in 1978. The submitter also stated that the recently synthesized and tested DATBP sample was probably representative of that which would result from a commercial process and was not as pure as the DATBP sample which was tested in 1978. The submitting company stated that it was not sure if the mutagenicity detected in the tests performed in 1980 was due to the DATBP itself or to some impurity in the sample. The company reported that additional short-term screening assays would be conducted on a highly purified DATBP sample in order to clarify this issue.

In its supplemental submission, FMC provided summarized results from its additional studies on "purified" DATBP. The company reported that the purified DATBP did not induce mitotic gene conversions in the in vitro Yeast Mitotic Gene Conversion Test, and was not mutagenic in an in vivo Mouse Micronucleus Test. The submitter reported, however, that the results of the Mouse Lymphoma Forward Mutation Assay indicated that purified DATBP was a weak mutagen. However, the submitter pointed out that the performing laboratory did not use the FMC-specified vehicle (DMSO) for this particular study and that the assay was being repeated with purified DATBP in DMSO solvent. FMC reported that the EPA would be advised of the results of the repeated Mouse Lymphoma Forward Mutation Assay upon completion.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

The submitted information indicates that purified DATBP does not have a high degree of acute in vivo toxicity. In addition, the submitter's suspicion that an impurity may have been responsible for the detected mutagenicity may be correct. However, without complete copies of the test protocols and data obtained from the studies cited in these submissions, an evaluation of the reported findings is not possible.

Current Production and Use

The FMC Corporation reported that DATBP is a research and development chemical which has been distributed in small quantities (one to four pounds) to several potential customers for testing as a flame retardant co-monomer. A search of the Master TSCA Inventory for diallyl tetrabromophthalate (CAS No. 49693-09-6) has shown that this chemical is not listed.

Comments/Recommendations

(a) The Chemical Hazard Identification Branch/AD will request the FMC Corporation to provide complete copies of the final results, including test protocols and data, from all of the laboratory studies cited in its submissions.

(b) The Chemical Hazard Identification Branch will review and evaluate the requested information, revise this status report as appropriate, and recommend further assessment if warranted.

(c) The Chemical Hazard Identification Branch will transmit copies of this status report to MSD/EPA and CCD/EPA.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0980-0360
Page 1 of 4

DATE: DEC - 4 1980

SUBJECT: Status Report* 8EHQ-0980-0360

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Approved 12/4/80

Revision Needed

Submission Description

The Hooker Chemicals and Plastics Corporation has submitted information on the possible carcinogenicity of benzoyl chloride (BC; CAS No. 98-88-4), benzotrichloride (BTC; CAS No. 98-07-7), and para-chlorobenzotrichloride (PCBTC; CAS No. 5216-25-1) in mice. The submission consists of four Japanese scientific articles, the respective English translations, and an evaluation of the reported in vivo findings which was prepared by a Hooker Corporation toxicologist.

According to the provided translations, benzoyl chloride was found to induce tumors in mice following inhalation exposure; benzotrichloride was shown to be carcinogenic following inhalation, dermal application, and oral administration to mice; para-chlorobenzotrichloride was found to be carcinogenic in mice following either oral administration or dermal application.

The submitting company stated that although this information has been published, it was submitted pursuant to TSCA Section 8(e) because the information was not available through the literature abstract services (i.e., Agricola, Biological Abstracts, Chemical Abstracts, Dissertation Abstracts, Index Medicus, and the National Technical Information Service) which are listed in Part VII(c) of the EPA's March 16, 1978 "Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" (43 FR 11110).

Submission Evaluation

The submitter has concluded that the provided experimental data indicate that BTC and PCBTC are chemical carcinogens. Although the mice exposed to BC via inhalation reportedly developed both benign and malignant lung tumors, the submitter assumes these particular data to be negative due to the lack of control animals in the study which would not allow a determination of "what the real increase over background is." The submitter's belief that the observed level (3 of 7) of lung tumors in the BC-exposed mice surviving to the 14th month "would be a reasonably, possibly low, level background" cannot be verified in view of the missing control data.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

The submitter feels that the provided experimental evidence is not sufficiently quantitative for risk assessment and expresses concern that sub-irritant concentrations were not used in the inhalation studies. These concerns may be valid from a standpoint of risk assessment and/or mechanism of carcinogenesis, but cannot undo the experimental findings of carcinogenicity for BTC and PCBTC, and the tumorigenicity of BC. Although it may be of interest to determine whether the lung tumors observed following inhalation are the result of direct cellular injury or mutation, such determinations cannot alter the findings of carcinogenicity; nor will more precise techniques of vapor exposure. Even if the inhalation and skin application studies were dropped or discounted, which they should not be, the oral administration studies do demonstrate the carcinogenicity of PCBTC and BTC. The tumors resulting from the oral administration of either compound were dose/response related and always higher than in the control groups. The submitter's statement that the technique of oral administration may have been inaccurate is not reflected by the dose-response data which were obtained in two studies.

Current Production and Use

A review of the production range (includes importation volumes) statistics for benzoyl chloride (CAS No. 98-88-4), which is listed in the initial TSCA Inventory, has shown that between 10 million and 52 million pounds of this chemical were produced/ imported in 1977. **/

Benzoyl chloride is used as an intermediate for the introduction of the benzoyl group in chemical syntheses. It has also been used in medicines.

A review of the production range (includes importation volumes) statistics for benzotrichloride (CAS No. 98-07-7), which is listed in the initial TSCA inventory, has shown that between 10 million and 50 million pounds of this chemical were produced/ imported in 1977. **/

Benzotrichloride is used in the manufacture of synthetic dyes and in other organic chemical syntheses.

A review of the production range (includes importation volumes) statistics for para-chlorobenzotrichloride (CAS No. 5216-25-1), which is listed in the initial TSCA Inventory, has shown that between 10 million and 51 million pounds of this chemical were produced/imported in 1977. **/

Para-chlorobenzotrichloride is used as an intermediate in the manufacture of pharmaceuticals, dyes, and other organic chemicals.

Comments/Recommendations

With regard to a perceived need for further toxicological information on the subject chemicals, the submitter's toxicologist stated that "it seems reasonable that the producer/user companies could get together and develop a cooperative program to generate some data. . . ."

a) The Chemical Hazard Identification Branch (CHIB/AD) will request the Hooker Chemicals and Plastics Corporation to describe the actions it has taken, in light of the provided toxicity data, to warn workers and others, and to reduce and/or eliminate exposure to the subject chemicals. In addition, the submitter will be informed of the EPA's interest in receiving the results, including test protocols and data, from the proposed cooperative studies designed to further define the toxicities of the subject chemicals.

b) The Chemical Hazard Identification Branch/AD will consider the preparation of Chemical Hazard Information Profiles (CHIPs) on benzoyl chloride, benzotrichloride, and para-chlorobenzotrichloride. The 1979 Carcinogen Assessment Group (CAG/ORD/EPA) preliminary assessment on benzoyl chloride will be considered in the CHIP review.

c) Benzoyl chloride, benzotrichloride, and para-chlorobenzotrichloride are listed in the EPA's February 29, 1980, TSCA Section 8(a) Level A rule (45 FR 13646).

d) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, FDA, NCI, CAG/ORD/EPA, and OWWM/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration

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**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

(OTI/OPTS/EPA) for distribution to EPA Regional Offices, State agencies, and to labor, environmental and selected citizen groups. In addition, the Industry Assistance Office (IAO/OTS/EPA) should consider providing a copy of this status report to the manufacturers/importers of the subject chemicals as listed in the Master TSCA Inventory, and to identified industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: OCT 30 1980

SUBJECT: Status Report* 8EHQ-0980-0361S

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Approved JM 11/5/80

Revision Needed ______

Submission Description

The submitting company (company name claimed confidential; TSCA CBI) provided the summarized results of in vitro Mouse Lymphoma Forward Mutation Assays on cobalt phthalocyanine disulfonate (CAS No. 29383-29-7) and cobalt phthalocyanine tetrasulfonate (CAS No. 14285-59-7). The submitter stated that the results indicate that both chemicals were mutagenic only following metabolic activation. In addition, the tetrasulfonate compound was reported to be less mutagenic than the disulfonate derivative.

Submission Evaluation

According to the provided summaries, both chemicals were found to be mutagenic only in the presence of metabolic activation. However, without complete copies of the test protocol and the data obtained, a complete evaluation of the reported mutagenicity is not possible at this time.

Current Production and Use

A review of the production range (includes importation volumes) statistics for cobalt phthalocyanine disulfonate (CAS No. 29383-29-7) which is listed in the initial TSCA Inventory, has shown that between 100 thousand and 1 million pounds of this chemical were produced/imported in 1977. This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. **/

A review of the production range (includes importation volumes) statistics for cobalt phthalocyanine tetrasulfonate (CAS No. 14285-59-7) which is listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a)). **/

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Information on the use(s) of the subject chemicals was claimed as confidential (TSCA CBI) by the submitter. No information on the use(s) of the chemicals was located in the secondary literature sources consulted.

Comments/Recommendations

The Agency believes that *in vitro* mutagenicity assays of this type provide valuable data that can aid in assessing the possible risks posed by chemicals to health and the environment. Although Mouse Lymphoma Forward Mutation test results, when considered alone, may not be sufficient to provide reasonable support for a conclusion of substantial risk, the addition of information concerning high production of and/or exposure to the chemicals would suggest the need for further more definitive toxicological testing.

The submitting company reported that the protective measures (i.e. gloves, eye protection, respirators, etc.) in force at its manufacturing operations ensure minimal chemical exposure to employees. In addition, the submitter stated that steps are being taken to inform and warn employees, customers, and others known to have potential exposures to the subject chemicals.

(a) The submitting company should be requested to provide complete copies of the results, including the test protocol and data, from the mutagenicity studies cited in its submission.

(b) The Chemical Hazard Identification Branch (CHIB/AD) will review the requested information, revise this status report as appropriate, and recommend further assessment if warranted.

(c) The Chemical Hazard Identification Branch will transmit copies of this status report to NIOSH and OSHA. The Industry Assistance Office/OTS should consider sending the same information to the manufacturer(s)/importer(s) of the subject chemicals listed in the Master TSCA Inventory.

(d) It is recommended that the subject chemicals be considered for inclusion in TSCA section 8(a) Level A reporting.

**/ The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0980-0362
Page 1 of 3

DATE: NOV 14 1980

SUBJECT: Status Report* 8EHQ-0980-0362

Approved 11/18/80

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Nalco Chemical Company submitted a complete copy of the final results of an acute inhalation study of the hydrochloride salt of a polymer of aniline and formaldehyde (CAS No. 57138-85-9) in albino rats. The submitter reported that a single 4-hour inhalation exposure (nominal concentration of 3.3 mg/liter) of the vapors of the compound in a water solution did not result in any clinical signs of intoxication or mortality. However, hydropic degeneration of the liver was observed upon necropsy and histological examination. This degeneration, which was characterized by the presence of vacoules in the cytoplasm of the hepatocytes with subsequent dislocation of the nucleus to the periphery, was considered by the performing laboratory to be reversible.

Submission Evaluation

The purpose of the submitted inhalation study is not readily apparent. In addition, the submitter stated that identity of the chemical compound(s) to which the animals were exposed was in question. In general, a single 4-hour exposure to a vapor is of limited value, particularly if the concentration is low and no acute clinical signs are observable. This type of study tells nothing about chronic toxicity.

The material tested was reported to be a "brown liquid" with no other properties recorded. It was reported that the tested hydrochloride salt was in an aqueous solution. Bubbling air through such a solution would most likely vaporize only the water. If the vapors were not readily analyzable, then the concentration of the polymer in the solution should have been determined at the start and at the end of the exposure. Perhaps the rats were exposed to only water vapor. In addition, it is not clear from the submission whether the solution generated during the exposure was as a mist or a true vapor. If the material was generated as a mist it must have been inhaled as such and also settled on the skin of the test animals. It is not clear if precautions were taken to prevent the animals from licking the compound from the skin.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

If the inhaled material was irritating to the lungs, it was mild. However, interpretation is complicated because the test animals were diseased with mycoplasmosis. The grey foci which were observed could have been due to endogenously aggregated material such as white thrombi or precipitated exogenous material such as the tested polymer. Either would be of concern.

Hydropic degeneration is a synonym for cloudy swelling of cells, as is vacuolar degeneration. It is a non-specific lesion due to inbibition of water (taking on of water) brought about by various toxic substances and by the lack of oxygen. Its occurrence in the liver of the rats suggests that the "spray?" might have been swallowed after licking from the skin. Its occurrence in the kidney tubules could have been due to absorption via the lungs or via the gut.

There is no evidence presented in the submission that the rats were exposed to anything but water. This and the non-specificity of the lesions, particularly in the rats with various disease states, make further evaluation impossible.

Current Production and Use

A review of the production range (includes importation volumes) statistics for the hydrochloride salt of a polymer of aniline and formaldehyde (CAS No. 57138-85-9), which is listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a)). **/

The Nalco Chemical Company reports that it has manufactured this substance at two locations, one of which is a pilot plant. The submitter did not provide any information on the use(s) of the material. No information on the use(s) of the chemical substance was located in the secondary literature sources consulted.

**/ The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Comments/Recommendations

The submitter stated that the provided inhalation study did give an unexpected result which will require additional investigation in order to determine the significance of the findings.

a) The Nalco Chemical Company will be requested to address the statements made in the Submission Evaluation section of this status report. In addition, the submitter will be requested to provide the results (including test protocols and data) from the proposed additional toxicity studies on the subject chemical.

b) The Chemical Hazard Identification Branch/AD will transmit a copy of this status report to OSHA and NIOSH.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0980-0363
Page 1 of 2

DATE: OCT 30 1980

SUBJECT: Status Report* 8EHQ-0980-0363

Approved 11/6/80

Revision Needed ________

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The International Coal Refining Company has provided a summary of the preliminary results from an Ames Salmonella (bacteria) test on Solvent Refined Coal (SRC) Recycle Solvent (CAS No. 68410-08-2). The submitter states that SRC Recycle Solvent was found to be mutagenic in that in vitro assay. The submitter also reports that the positive result was expected based on the available scientific literature indicating the carcinogenic potential of high boiling point, coal-derived materials.

Submission Evaluation

According to the summary information provided, SRC Recycle Solvent was found to be mutagenic for Salmonella strains TA98 and TA100. The submission does not indicate, however, whether the mutagenic effects were observed in the presence or absence of a metabolic activation system. Without complete copies of the experimental protocol and the data obtained, an evaluation of the reported mutagenicity of SRC Recycle Solvent is not possible at this time.

Current Production and Use

A review of the production range (includes importation volumes) statistics for SRC Recycle Solvent (CAS No. 68410-08-2) which is listed in the initial TSCA Inventory, has shown that between 10 thousand and 100 thousand pounds of this chemical were produced/imported in 1977. **/

According to the TSCA Inventory, SRC Recycle Solvent is the liquid used to form the slurry for treating coal in the presence of hydrogen at high temperatures (over 800°F); the solvent boils at temperatures ranging from 480° to 850°F. The submitter reports that this process solvent is an internal, enclosed stream, and that employee exposure is expected to be minimal.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Comments/Recommendations

The Agency believes that *in vitro* mutagenicity assays of this type provide valuable data that can aid in assessing the possible risks posed by chemicals to health and the environment. Although Ames test results, when considered alone, may not be sufficient to provide reasonable support for a conclusion of substantial risk, the addition of information concerning high production of and/or exposure to the chemical would suggest the need for further more definitive toxicological testing.

The EPA has received and evaluated other Section 8(e) submissions on coal-derived and coal process materials: 8EHQ-0778-0217, 8EHQ-1078-0247, 8EHQ-1078-0252, 8EHQ-0779-0297, 8EHQ-0979-0306 and 8EHQ-1179-0316.

(a) The International Coal Refining Company should be requested to provide complete copies of the final report, including the test protocol and data, from the mutagenicity study cited in its submission. In addition, the company should be requested to describe the actions it has taken in response to the submitted toxicity information to warn workers and others, and to reduce and/or eliminate exposure to SRC Recycle Solvent.

(b) The Chemical Hazard Identification Branch (CHIB/AD) will review the requested information, revise this status report as appropriate, and recommend further assessment if warranted.

(c) The Chemical Hazard Identification Branch will transmit copies of this status report to DOE, OSHA, NIOSH, OWWM/EPA, and ORD/EPA. The Industry Assistance Office (IAO/OTS) should consider sending the same information to the manufacturers/importers of SRC Recycle Solvent listed in the Master TSCA Inventory. CHIB will also provide a copy of this status report and copies of the above listed status reports to the OPTS Synfuels Coordinator.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Informaiton. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0980-0364
Page 1 of 3

DATE: NOV 14 1980

SUBJECT: Status Report* 8EHQ-0980-0364

Approved JM 11/18/80

Revision Needed ______

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

In a submission which was hand-delivered to the EPA Administrator's Office, Exxon Chemical Americas provided a summary of preliminary results from the first phase of a 90-day inhalation study of dicyclopentadiene (CAS No. 77-73-6) in male and female Fisher 344 rats. According to the submission, male rats exposed to the chemical at 1, 5, and 50 ppm were found to have varying degrees of anatomical and/or functional kidney changes which were apparently dose related. The submitter reported that the observed changes are non-specific and are those which are found in that particular rat strain during the normal aging process and/or following toxic insult.

Submission Evaluation

Dicyclopentadiene is a highly reactive chemical and is probably an effective hapten. As such, and in common with other hydrocarbons, it could produce antibodies which would react with the dicyclopentadiene to precipitate in the membranes of glomeruli in the kidneys. This process results in hydrocarbon proliferative glomerulonephritis and approximates the descriptions of the observed effects noted in the provided summary. In addition, the diluted urine and cellular debris suggests that dicyclopentadiene produces typical hydrocarbon tubular nephrosis of the kidney. The dilute urine could also be due to renal diabetes insipidus.

It is doubtful that the kidney lesions observed in the test animals were non-specific due to aging. It is assumed that the rats used in the experiment were approximately 6 months old which is not an age when changes in the kidneys (not due to toxicity) typically occur.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

A review of the production range (includes importation volumes) statistics for dicyclopentadiene (CAS No. 77-73-6), which is listed in the initial TSCA Inventory, has shown that between 53 million and 282 million pounds of this chemical were produced/imported in 1977. **/

Dicyclopentadiene is used as a chemical intermediate in the manufacture of insecticides and other organic chemicals. It is also used in the manufacture of certain paints, varnishes, and flame retardants for plastics.

Comments/Recommendations

The submitting company reported that, upon completion, the final results from this inhalation study will be forwarded to the EPA. The submitter also reported that the results of the experiment will provide preliminary information on the reversibility of the observed kidney effects.

a) In this particular case, the Exxon Chemical Americas submission of this section 8(e) information to the EPA Administrator's Office did not unduly burden the EPA's processing of the notice. However, it should be brought to the submitter's attention that the substantial risk information reporting requirements (Part IX of the EPA's March 16, 1978, "Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" (43 FR 11110)) clearly specify that TSCA section 8(e) notices are to be sent to the Document Control Officer, Management Support Division, Office of Pesticides and Toxic Substances (WH-557), Environmental Protection Agency, 401 M Street S.W., Washington, D.C. 20460. The Chemical Hazard Identification Branch will provide a copy of the March 16, 1978, policy statement to the submitter.

b) The submitting company should be requested to describe the actions it has taken, in light of the provided toxicity data, to warn workers and others, and to reduce and/or eliminate exposure to dicyclopentadiene.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

c) The Chemical Hazard Identification Branch (CHIB/AD) will, upon receipt, review the final results (which should include test protocols and data) from the 90-day inhalation study, revise this status report as appropriate, and recommend additional assessment if warranted.

d) CHIB will consider updating the draft Chemical Hazard Information Profile (CHIP) on dicyclopentadiene to include a discussion of these new and other relevant data.

e) Dicyclopentadiene is listed in the EPA's February 29, 1980 proposed TSCA Section 8(a) Level A rule (45 FR 13646).

f) The Chemical Hazard Identification Branch will transmit copies of this status report to NIOSH, OSHA, CPSC, and OWWM/EPA. The Industry Assistance Office/OTS should consider sending the same information to the manufacturers/importers of dicyclopentadiene listed in the Master TSCA Inventory.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0980-0365
Page 1 of 3

DATE: NOV - 6 1980

SUBJECT: Status Report* 8EHQ-0980-0365

Approved 11/12/80

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

S. C. Johnson & Son, Inc. has submitted a complete copy of the the final results of an acute aspiration (intra-tracheal) test of 1,1,1-trichloroethane (methylchloroform; CAS No. 71-55-6) in rats. The submitting company stated that it had anticipated that if death occurred, it would have been due to a chemical pneumonitis. However, the submitter reported that death was apparently due to "acute pulmonary hemorrhage."

Submission Evaluation

1,1,1-Trichloroethane is an irritant and an excellent solvent for lipids. It is capable of blocking the conduction system in the heart and can produce cardiac ventricular arrhthymias.

With regard to the submitted results, it should be noted that the rat trachea has a volume of approximately 0.75 ml. Therefore, the 0.2 ml of 1,1,1-trichloroethane introduced directly into the trachea is a relatively significant amount. The chemical would immediately flow into the alveoli of the lung where it would dissolve lipids in pulmonary and endothelial membranes which could result in bleeding. It would also dissolve the phospholipids of the lung surfactant.

The observed rapid deaths of the test animals suggests that the chemical was absorbed rapidly from the lungs directly into the left heart without dilution by the general circulation. This would result in either a complete block of conduction or in ventricular fibrillation. Either effect would cause a sudden death.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

A review of the production range (includes importation volumes) statistics for 1,1,1-trichloroethane (CAS No. 71-55-6) which is listed in the initial TSCA Inventory, has shown that between 253 million and 1.13 billion pounds of this chemical were produced/imported in 1977. **/

1,1,1-Trichloroethane is used in cold process metal cleaning operations, vapor degreasing operations, and as an intermediate in the production of vinylidine chloride. The chemical is also used in adhesives as a resin solvent, as a lubricant carrier to inject graphite (or other lubricants such as greases), and as a coolant in cutting oils. Other miscellaneous applications include use in drain cleaners, shoe polishes, spot cleaners, insecticides, printing inks, stain repellents, and textile processing and finishing.

Comments/Recommendations

The International Agency for Research on Cancer (IARC) recently found that available data were not sufficient to allow an evaluation of the carcinogenic potential of 1,1,1-trichloroethane (IARC Monograph, Volume 20, October 1979). The chemical is currently being tested for carcinogenicity (oral route; rats and mice) by the National Cancer Institute (NCI)/National Toxicology Program (NTP).

The Test Rules Development Branch (TRDB/AD), in conjunction with the Health and Environmental Review Division/OTS, is reviewing data obtained by the EPA pertaining to 1,1,1-trichloroethane as designated by the Interagency Testing Committee (ITC).

a) S. C. Johnson & Son, Inc. should be requested to describe the actions it has taken, in light of the provided toxicity data, to warn workers and others, and to reduce and/or eliminate exposure to 1,1,1-trichloroethane.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

b) The Chemical Hazard Identification Branch (CHIB/AD) will transmit copies of this status report to NIOSH, OSHA, CPSC, and TRDB/AD/EPA. The Industry Assistance Office (IAO/OTS) should consider sending the same information to the manufacturers/importers of 1,1,1-trichloroethane listed in the Master TSCA Inventory.

c) In light of the fact that 1,1,1-trichloroethane was listed in the submission as "Insecticide 5198D72", CHIB will transmit a copy of the submission and status report to the Registration Division of the Office of Pesticide Programs (OPP/EPA).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1080-0366
Page 1 of 3

DATE: JAN 28 1981

SUBJECT: Status Report* 8EHQ-1080-0366

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Approved JM 1/28/81

Revision
Needed ______

Submission Description

The Mobil Research and Development Corporation has submitted summarized results from several laboratory studies of dimethyl hydrogen phosphite (CAS No. 868-85-9). According to the submitter, the chemical was found to be positive in two of five short-term mutagenicity screening tests. In addition, the submitter reported that cataracts and "other toxic effects" were observed in rats exposed (subacutely) to dimethyl hydrogen phosphite at high vapor concentrations (i.e., 119 and 198 ppm). Milder forms of lens opacities were reportedly observed in rats exposed to 12 and 35 ppm. The submitting company also reported that although no clinical cataracts were found in a previously performed ophthalmological study of plant employees, including those involved with the manufacture of dimethyl hydrogen phosphite, a reanalysis of the original data will be conducted "to determine whether there may be a statistically significant number of subclinical opacities among the dimethyl hydrogen phosphite segment of the plant population."

Although the submitting company states that its laboratory findings "suggest a potential hazard under conditions of excessive long term exposure" to dimethyl hydrogen phosphite, the company reports that the chemical, which has a low vapor pressure (2.5 mm Hg at 38°C and 25 mm Hg at 72°C) and is manufactured by Mobil in small volumes in a closed system, "presents no significant hazard" in its workplace.

Submission Evaluation

With regard to mutagenicity, dimethyl hydrogen phosphite was reported to be positive in *Drosophila* tests and in an *in vitro* mouse lymphoma assay (with metabolic activation). The submitter reported that without metabolic activation, the chemical was negative for mutagenicity in the mouse lymphoma assay, and negative in the in vitro Ames test (both with and without metabolic activation). The results of an in vitro DNA repair test were reported to be inconclusive. As provided, the summarized test results do indicate that dimethyl hydrogen phosphite has some degree of mutagenic activity. However, without complete copies of all protocols and data obtained from the cited studies, further evaluation of that activity is not possible at this time.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

With regard to the summarized results from the vapor exposure studies in rats, the submitter did not provide any information on the "other toxic effects" observed or on the types of cataracts found. Subcapsular cataracts can result from chronic inflammation, while direct denaturation of lens proteins could give rise to more rapid opaque changes. In addition, the phosphite could be a weak alkylating agent as well as a weak anticholinesterase agent. Either action could result in cataracts. Complete copies of the rat study protocols and data should be requested for further evaluation.

It should be noted that dimethyl hydrogen phosphite has biological properties similar to those previously reported for trimethyl phosphite (TMP) by the Mobil Research and Development Corporation pursuant to TSCA Section 8(e) (8EHQ-0679-0291 et seq.). Both compounds produced cataracts in rats and both were negative in the Ames test but were positive in other short term tests for mutagenicity. (It should also be noted that in light of the submitted data on trimethyl phosphite, which also indicated a teratogenic effect in rats (oral route), a Chemical Hazard Information Profile (CHIP) was recommended for that chemical and is now in preparation.)

Current Production and Use

A review of the production range (includes importation volumes) statistics for dimethyl hydrogen phosphite (CAS No. 868-85-9), which is listed in the initial TSCA Inventory, has shown that between 210 thousand and 2.1 million pounds of this chemical were produced/imported in 1977.**/

The submitter reported that dimethyl hydrogen phosphite is manufactured for chemical speciality use. Information on the actual use(s) of the chemical was not provided by the submitter nor located in the secondary literature sources consulted.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Comments/Recommendations

The Mobil Research and Development Corporation reported that it is informing its employees and customers of the submitted toxicological findings for dimethyl hydrogen phosphite. In addition, the submitter stated that any significant findings from the reanalysis of the previous ophthalmological study of its workers would be reported to the EPA.

a) The Chemical Hazard Information Branch (CHIB/AD) will request the Mobil Research and Development Corporation to provide complete copies of the results, including test protocols and data obtained, from all of the laboratory studies cited in its submission. In addition, the submitting company will be asked if it plans to conduct any further toxicological studies on dimethyl hydrogen phosphite, especially with regard to teratogenicity.

b) It is recommended that dimethyl hydrogen phosphite be considered for inclusion in TSCA Section 8(a) Level A reporting.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to OSHA and NIOSH. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for distribution to EPA Regional Offices and State agencies, and to labor, environmental, and selected citizen groups. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and/or importers of the subject chemical as listed in the Master TSCA Inventory, and to identified industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: APR 6 1981

SUBJECT: Status Report* 8EHQ-1080-0367

Approved JM 4/13/81

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Olin Corporation has submitted a copy of a Health Hazard Evaluation Determination Report which was prepared by the National Institute for Occupational Safety and Health (NIOSH) in response to an employee representative's request for an evaluation of the Olin Chemical Company facility in Brandenburg, Kentucky. According to the NIOSH summary, the evaluation was requested by employees of the toluene diamine (TDA) manufacturing area in that plant who had alleged that increased rates of spontaneous abortions occurred in the wives of TDA workers. According to Olin, the toluene diamine produced contains approximately 80% 2,4-toluene diamine (CAS No. 95-80-7) and 20% other TDA isomers including 2,6-toluene diamine. Olin also provided a copy of a NIOSH Interim Report (No. 2; April, 1980) and a NIOSH Health Hazard Evaluation Medical Report (June, 1980) concerning the Olin plant in Brandenburg, Kentucky.

In the initial employee request, which was received by NIOSH on June 29, 1979, it was alleged that there was overexposure to the chemicals used or produced in the TDA unit resulting in "reproductive failures" among the workers. According to NIOSH, the purpose of the initial study was to evaluate TDA and 2,4-dinitrotoluene (DNT; CAS No. 121-14-2) exposures and health effects in the TDA unit. The NIOSH report states that the results of an initial walk-through survey "revealed a history of miscarriages, abnormal offspring, and semen abnormalities in the TDA unit workers." Based on those findings, NIOSH scheduled a followup investigation (conducted January 14-18, 1980) which included a detailed medical survey of the TDA workers and monitoring of airborne levels of both TDA and DNT. Based on the results of the studies conducted during their evaluation, NIOSH has "determined that while this study cannot be interpreted as conclusive proof of TDA or DNT toxic effects on the male reproductive system, it is strongly suggestive of a problem in workers exposed to these agents. These effects were observed in the presence of declining DNT and TDA exposures, none of which exceeded current OSHA exposure limits during the survey."

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

A detailed discussion of the NIOSH findings and recommendations are contained in the text of the submitted report. NIOSH reports that based on the results of semen analyses, further studies will be conducted on previously collected serum specimens. NIOSH also plans to identify other plants using TDA in order to conduct evaluations to find if similar problems exist among other TDA workers. NIOSH reports that it will recommend that the National Toxicology Program (NTP) conduct animal studies to determine if reproductive effects can be demonstrated.

With regard to the NIOSH determinations that the subject studies are "strongly suggestive of a problem in workers" exposed to TDA and DNT, the Olin Corporation stated in the cover letter to its submission that it disputes this and other NIOSH conclusions made in the report and intends to comment directly to NIOSH. In submitting the NIOSH study under Section 8(e), the company reports that it has not concluded that the provided "information supports or fails to support the conclusion that a certain chemical substance(s) or mixture(s) presents a substantial risk of injury to health or the environment."

Note: On January 4, 1980, EPA scientists met with representatives from the Olin Corporation and at that time received information (FYI-OTS-0180-0055) from an interim (November, 1979) NIOSH report. At that meeting, the EPA was informed that further information concerning this situation would be forwarded to the Agency.

Submission Evaluation

The NIOSH epidemiologic study entailed a retrospective cohort investigation primarily of reproductive effects among 30 male workers. The study group size was very small and may limit the overall interpretation of the study. These men were among a larger group of individuals who volunteered to participate in the study. Non-participation resulted from individuals' lack of willingness to provide sperm specimens or pre-existing health conditions thought to influence reproductive health.

The 30 men were assigned by job description information into subgroups of exposed (9), or intermediate (12), or control (9). Exposed group individuals were defined as those with the most current continual contact to TDA, as well as to DNT. Intermediate was defined as intermittent exposure for one or more years, but not within the two years prior to the study. Control group individuals were those who had no known exposure to TDA during Olin employment. Many ambient samples of DNT and TDA taken in the work environment at the time of the study were below the limit of detection. Although no measurements exceeded OSHA's TLV for DNT (1.5 mg/M^3), NIOSH believed that exposure had diminished recently.

Medical and work histories were obtained, and physical and clinical examinations were conducted among the cohort. In addition, a questionaire on reproductive history was administered to the workers' wives. No statistically significant differences ($p > .05$) were observed between the three groups of workers regarding history or physical examination. Although not statistically significant, the NIOSH study found that more exposed than control workers' wives reported spontaneous abortion. NIOSH reported two statistically significant clinical findings. First, there was a significant reduction in the number of large morphologic forms of sperm in the exposed group when compared to controls ($p = .015$). NIOSH stated in the report that the biological significance of this finding is unknown. Second, there was a significant reduction in sperm count in the exposed group compared to control group ($p = .03$). This difference persisted when age of workers was controlled.

The EPA believes that a number of experimental design and statistical limitations in the provided study greatly influence the overall interpretation of the obtained results. A selection bias may have resulted from only a self-selected portion of the exposed workers participating in the study, while reliance on recall of the participating workers and their wives in establishing medical and work histories and the failure to use "blinded" investigators may have contributed observational bias to the study. The EPA also believes that alternative statistical procedures would have been more appropriate in analyzing some of the obtained data. For example, in analyzing the incidence of spontaneous abortions, congenital defects, and total pregnancies before and after Olin employment, the investigators used the chi-square and Fisher's exact tests. Because the groups before and after Olin employment were not independent of one another (an assumption required by the use of these tests), a non-parametric analysis, such as a sign test or McNemar's test for matched data, would have been more appropriate. It should also be noted that the study provides no direct evidence that either TDA or DNT had passed through the bodies of the exposed workers. The workers' blood could have been examined for Heinz bodies, methemoglobinemia, and anemia, and the urine could have been analyzed for metabolites of the amino and nitro compounds. The study's finding of a statistically significant reduction in sperm count among the exposed workers provides a basis for concern about the ability of TDA and/or DNT to cause reproductive effects. However, in view of the limitations of the study, the EPA believes that further investigation is needed to confirm if such effects are produced by TDA and/or DNT.

Current Production and Use

A review of the production range (includes importation volumes) statistics for 2,4-toluene diamine (CAS No. 95-80-7), which is listed in the initial TSCA Inventory, has shown that between 130 million and 350 million pounds of this chemical were reported as produced/imported in 1977. **/

2,4-Toluene diamine is a chemical intermediate for toluene diisocyanate (used in the production of flexible and rigid polyurethane foams; polyurethane coatings; cast elastomers including fabric coatings; polyurethane and other adhesives), and for dyes used for textiles, leather, furs, and in hair-dye formulations.

A review of the production range (includes importation volumes) statistics for 2,4-dinitrotoluene (CAS No. 121-14-2), which is listed in the initial TSCA Inventory, has shown that between 100 million and 500 milllion pounds of this chemical were reported as produced/imported in 1977. **/

Manufacture of toluene diisocyanate consumes much of the 2,4-dinitrotoluene produced. 2,4-Dinitrotoluene is also used as a gelatinizing and waterproofing agent in explosives and as a dye intermediate.

Comments/Recommendations

The International Agency for Research on Cancer (IARC) has prepared a report on the carcinogenic risk of exposure to 2,4-toluene diamine (IARC Monograph; Vol 16, 1978). In addition, the Chemical Hazard Identification Branch (CHIB/AD/EPA) has prepared Chemical Hazard Information Profiles (CHIPs) on both 2,4-toluene diamine and 2,4-dinitrotoluene.

The National Cancer Institute has tested both 2,4-toluene diamine and 2,4-dinitrotoluene for carcinogenicity. According to the 1979 NIOSH Registry of Toxic Effects of Chemical Substances (RTECS), 2,4-toluene diamine was found by NCI to be positive in mice and rats, and 2,4-dinitrotoluene was found to be positive in rats.

The existing Chemical Hazard Information Profile on 2,4-toluene diamine recommends that the chemical be considered for inclusion

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**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

in future TSCA Section 8(a) Level A reporting. 2,4-Dinitrotoluene (CAS No. 121-14-2) is listed in the EPA's February 29, 1980 proposed TSCA Section 8(a) Level A rule (45 FR 13646). 2,4-Dinitrotoluene is also included in the EPA's current list of 129 Priority Pollutants.

a) The Chemical Hazard Identification Branch will ask the Olin Corporation if it plans to conduct further epidemiological and/or clinical studies of its workers exposed to TDA and DNT. Olin will also be requested to describe the actions it has taken, in light of the submitted NIOSH report and the NCI findings, to warn workers and others, and to reduce and/or eliminate exposure to the subject chemical substances.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, NCI/NTP, and OWWM/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for appropriate distribution. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and/or importers of the subject chemicals as listed in the Master TSCA Inventory, and to industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1080-0368
8EHQ-1180-0368 Supplement
Page 1 of 2

DATE: JAN 22 [illegible]

SUBJECT: Status Report* 8EHQ-1080-0368
8EHQ-1180-0368 Supplement

Approved 1/27/81

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

In its initial submission, the Sodyeco Division of Martin Marietta Chemicals reported that small quantities of certain organic compounds (toluene, ethylbenzene, chlorobenzene, 1,2-dichlorobenzene, and meta- and para-xylenes) had been detected in the well water serving its plant site (and several nearby sites) in Charlotte, North Carolina. The submitting company reported that although the source of the contamination was not known, the EPA was being advised because the compounds were in use by the submitter. The submitter also reported that although it believed that no substantial risk exists, it was expanding its analyses to determine the extent of contamination and "taking all actions that may be indicated to correct the situation expeditiously."

In the initial submission, Sodyeco provided the location of the subject plant site and a map of that site giving the location of the sampling stations. In addition, the submitter provided copies of the sampling and analyses procedures and the laboratory results keyed to the provided map. The submitter also included a discussion of the company actions both taken and planned with regard to this reported underground water contamination. Sodyeco stated that it believes that its "actions to date will continue to provide safe drinking water to all concerned." With regard to planned activities, Sodyeco stated that its "plans are aimed at eliminating any sources of these chemicals or pathways that lead to groundwater supply systems."

In its supplemental submission, Sodyeco reported that it had corrected the plant water system and had found that nearby residences had not been exposed to significant concentrations of toxic substances. The submitter also reported that every attempt will be made to provide two commercial neighbors with a pure, permanent water supply to replace the temporary filter systems currently being used. In addition, Sodyeco stated that its system of unlined treatment lagoons was believed to be the source of the general infiltration (which was reportedly enhanced in several locations by local ground conditions). The submitter stated, however, that preliminary engineering had begun for an effective containment system and that other minor potential sources were being corrected. In conclusion, Sodyeco stated that its "program is moving agressively toward a suitable solution..."

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

Although all of the organic chemical contaminants reported are of toxicologic concern, 1,2-dichlorobenzene and chlorobenzene are of greatest concern. These two compounds are irritants and are more toxic when administered by mouth than by subcutaneous injection. Both are capable of damaging the liver and affecting the bone marrow.

The submitter's toxicology report suggests that no harm to health occurred because of the short time of chemical exposure. However, the report fails to take into account that synergistic action, particularly between the two chlorobenzenes, may have occurred. Toluene, ethylbenzene, and the xylenes are metabolized by the liver to compounds that are readily excreted by the kidney. At present, however, there are no studies that answer the question of how low concentrations of hepatotoxic substances (e.g. chlorobenzenes) affect the metabolism and elimination of the three hydrocarbons.

Current Production and Use

Based on the nature of the submissions, a report on the current production and uses of the subject chemical compounds does not appear to be necessary at this time.

Comments/Recommendations

Upon receipt, the Chemical Hazard Identification Branch (CHIB/AD) provided copies of both the initial and supplemental Section 8(e) submissions to OWWM/EPA and to the EPA's Region IV Office in Atlanta, Georgia for appropriate followup actions.

Toluene, ethylbenzene, chlorobenzene, and 1,2-dichlorobenzene are currently included in the EPA's list of 129 Priority Pollutants. The Test Rules Development Branch (TRDB/AD/EPA) is currently reviewing information received by the EPA pertaining to toluene, xylenes, and chlorobenzenes.

a) The Chemical Hazard Identification Branch will provide a copy of the status report to TRDB/EPA, OWWM/EPA, and to the EPA Region IV Office for inclusion in its files on this reported ground water contamination.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

AUG 6 1980

8EHQ-0780-0369
Page 1 of 5

DATE: Revised (November 26, 1980)

SUBJECT: Status Report* 8EHQ-0780-0369
(Previously FYI-OTS-0780-0075)

Approved 11/28/80

Revision
Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

On May 12, 1980, several EPA scientists met with, and at the request of, a past Director of Toxicology for the American Cyanamid Company to discuss the results from certain in vivo studies performed for the company prior to 1979. At that meeting, the EPA was informed that high doses of two flame retardant products had been found to produce neurotoxic effects in laboratory animals. Specifically, the tested chemicals were reported to be CYAGARD® RF-1 (ethylenebis[tris(2-cyanoethyl)] phosphonium bromide) and PYROSET® TKO (tetrakis(hydroxymethyl) phosphonium sulfate). At that May 12 meeting, the EPA requested (verbally) and was assured that complete copies of the American Cyanamid toxicity files on both products would be forwarded to the Agency for review and evaluation.

In response to this EPA request, the American Cyanamid Company provided (FYI-OTS-0780-0075) the results from several short-term in vivo studies on CYAGARD® RF-1. The submission indicated that neurotoxic effects (e.g. unsteady restricted gait, hind limb paralysis) were observed in rats following oral administration of the compound, either as part of the daily diet or by gavage. However, CYAGARD® RF-1 did not appear to cause neurotoxic effects in rats following dermal application. The submitter also provided a CYAGARD® RF-1 technical data sheet which included recommended handling precautions.

Although specifically requested by the EPA on May 12, 1980, American Cyanamid did not provide any toxicity data on PYROSET® TKO in its FYI submission.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

The ethylenebis[tris(2-cyanoethyl)]phosphonium bromide product (CYAGARD® RF-1) has two potentially neurotoxic chemical configurations: 1) the compound is an analog of bisalkyl quarternary ammonium compounds that can act at autonomic nervous system ganglia or at neuromuscular junctions to produce blockade or paralysis by preventing the release of acetylcholine; 2) the compound is also an analog of polynitriles (e.g. iminodipropionitrile), which produce neurolathyrism resulting in muscle paralysis such as that observed in the submitted feeding study in rats. Nitriles of this type can produce degenerative changes both to the spinal cord tracts that lead to the Purkinje cells of the cerebellum and to the Purkinje cells themselves. It is of interest to note that people in certain parts of the world (e.g. India) may develop a wasting paralysis after eating plants in the sweet pea family (lathyrus) that contain nitriles of this type.

The low oral LD_{50} observed (10 g/kg in rats) for CYAGARD® RF-1 is not highly significant in light of the fact that quarternary nitrogen, phosphorous, and arsenic compounds are not readily absorbed from the intestine.

Current Production and Use

A review of the production range (includes importation volumes) statistics for ethylenebis[tris(2-cyanoethyl)]phosphonium bromide (CAS. No. 10310-38-0) which is listed in the initial TSCA Inventory, has shown that between 10 thousand and 100 thousand pounds of this chemical were produced/imported in 1977.**/

American Cyanamid reported that CYAGARD® RF-1 is sold in limited commercial quantities as a flame retardant in molded plastic parts in certain types of electrical component and communication equipment.

Comments/Recommendations

Following a review of the provided information on CYAGARD® RF-1, it was the EPA's preliminary determination that these neurotoxicity and exposure data should have been submitted to the Agency at an earlier date pursuant to Section 8(e) of the Toxic Substances Control Act (PL 94-469). The basis for this EPA determination was as follows:

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

The preface to Part V of the Agency's March 16, 1978, "Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" (43 FR 11110) states that a "substantial risk of injury to health or the environment is a risk of considerable concern because of (a) the seriousness of the effect... and (b) the fact or probability of its occurrence." With regard to the seriousness of the effect, Part V explains further that the Agency considers the health effects for which substantial risk information must be reported to include "any pattern of effects or evidence which reasonably supports the conclusion that the chemical substance or mixture can produce... toxic effects resulting in death, or serious or prolonged incapacitation." The information respecting these effects can be obtained directly or inferred from designed studies (e.g. _in vivo_ experiments and tests as described in Part VI of the policy statement). With regard to the "fact or probability of its occurrence" criterion, Part V also provides that certain health effects are so serious that relatively little weight should be given to the chemical's exposure in determining whether a risk is substantial. The mere fact that an implicated chemical is in commerce constitutes sufficient evidence of exposure.

With regard to the reporting of substantial risk information, Section 8(e) of the Toxic Substances Control Act (TSCA) (90 Stat. 2029, 15 U.S.C. 2607), states in part that a person who obtains substantial risk information "must immediately inform the Administrator...." Part IV of the EPA's Section 8(e) policy statement of March 16, 1978, states that this obligation to report "immediately" is fulfilled if the EPA receives the information (via the reporting requirements specified in Part IX) within 15 working days after the date a subject manufacturer, processor, or distributor obtains such information. With regard to information first obtained by a subject person prior to the effective date of TSCA, Part VIII of the Section 8(e) policy statement explains that any substantial risk information possessed by a person prior to January 1, 1977, of which that person is aware after that date, shall be reported to the EPA within 60 days of March 16, 1978.

Because of the pattern and nature of the observed _in vivo_ neurotoxicological effects which can result in serious or prolonged incapacitation, or death, and the fact that CYAGARD® RF-1 is and has been in commerce, the Agency believed that the information contained in FYI-OTS-0780-0075 provided reasonable support for a conclusion of substantial risk as defined in the EPA's March 16, 1978, Section 8(e) policy statement. The Agency also believed that the subject information should have been more properly submitted by the American Cyanamid Company to the EPA at an earlier date pursuant to TSCA Section 8(e).

The American Cyanamid Company stated that all of its customers have been informed of the neurotoxicity findings on CYAGARD® RF-1. In addition, the submitter believes that this chemical can be safely handled with a combination of good personal hygiene and simple measures to avoid dust inhalation.

a) On August 8, 1980, the American Cyanamid Company was requested to provide its rationale as to why the neurotoxicity and exposure data obtained by the company on CYAGARD® RF-1 was not submitted to the EPA at an earlier date pursuant to TSCA Section 8(e). American Cyanamid was given an opportunity (20 working days) to rebut the Agency's preliminary determination as to the Section 8(e)-applicability of the information provided by the company in FYI-OTS-C780-0075.

b) In addition, the American Cyanamid Company was requested to provide complete copies of any and all studies (other than those already fully provided in FYI-OTS-0780-0075) conducted for and by the American Cyanamid Company for the purpose of assessing the biological activity of CYAGARD® RF-1. This information was requested to include complete test protocols, data obtained, conclusions drawn (if any) and the date(s) of performance.

c) As prevously stated in this status report, the Agency was informed at the May 12, 1980 meeting that another flame retardant product, PYROSET® TKO, had also been found to be neurotoxic in earlier laboratory studies performed for the American Cyanamid Company. It was agreed (verbally) at that meeting that complete copies of the company's toxicity files on this product would be provided to the EPA for review and evaluation. This requested information on PYROSET® TKO was not, however, provided to the EPA in American Cyanamid's initial submission. The American Cyanamid Company was therefore formally requested to provide complete copies of any and all studies conducted for and by the company for the purpose of assessing the biological activity of PYROSET® TKO. This information was also to include complete test protocols, data obtained, conclusions drawn (if any), and the date(s) of performance.

d) In its response (FYI-OTS-0980-0075 Followup Response) to the EPA's August 8, 1980 letter, the American Cyanamid Company stated that it had "reviewed the question of reportability under Section 8(e) of TSCA in light of the comments contained in [that EPA letter] and do not object to the delivery of the information contained in either submission to the OPTS Document Control Officer for ... filing as Section 8(e) substantial risk information." The company also stated that it would take the Agency's comments into consideration in future determinations of this type. Following a review of the company's response, the Chemical Hazard Identification Branch delivered all information contained in FYI-OTS-0780-0075 to the OPTS Document Control Officer (DCO) for appropriate handling and public filing as TSCA Section 8(e) substantial risk information. The following substantial risk notice log number was assigned by the DCO: 8EHQ-0780-0369.

e) CHIB has reviewed and evaluated the additional information requested and revised this status report as appropriate. In addition, CHIB has prepared a status report on the information which was provided by the American Cyanamid Company on PYROSET® TKO and other PYROSET® flame retardant products (8EHQ-0980-0369 Followup Response).

f) It is recommended that ethylenebis[tris(2-cyanoethyl] phosphonium bromide (CYAGARD® RF-1) be considered for inclusion in TSCA Section 8(a) Level A reporting.

g) CHIB will transmit a copy of this revised status report to OSHA, NIOSH, FDA, CPSC, OE/EPA, and the American Cyanamid Company. CHIB will also provide a copy of the revised status report to the Office of Toxics Integration (OTI/OPTS/EPA) for distribution to EPA Regional Offices and State agencies, and to labor, conservation, and selected citizen groups. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and importers of the subject chemical listed in the Master TSCA Inventory, and to identified industry-associated groups.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0980-0369 Followup Response
Page 1 of 7

DATE: DEC - 4 1980

SUBJECT: Status Report* 8EHQ-0980-0369 Followup Response

Approved 12/4/80

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

Per the Agency's requests in a followup letter (August 8, 1980), the American Cyanamid Company provided additional toxicological data (patch tests on human skin) on CYAGARD® RF-1 (ethylenebis-tris(2-cyanoethyl)].phosphonium bromide; CAS No. 10310-38-0) and toxicity data (patch tests on humans and acute toxicity tests in animals) on several tetrakis(hydroxymethyl) phosphonium salts including PYROSET® TKO (tetrakis(hydroxymethyl) phosphonium sulfate; CAS No. 55566-30-8). According to the submitted information, several of the tested PYROSET® flame retardants were found to be neurotoxic in the performed animal experiments. A list of the flame retardant compounds tested by the submitter is shown below in Table 1.

Table 1. Flame Retardant Compounds Tested

PYROSET®	Tetrakis(hydroxymethyl) phosphonium Salts	CAS Reg. No.
(None)	Acetate (1:1)	7580-37-2
TKC	Chloride (1:1)	124-64-1
TKO	Sulfate (2:1)	55566-30-8
TKP	Mixture of phosphate and acetate salts	- - - - -
TKS	Oxalate (2:1)	52221-67-7
TK-115	Same as TKO	- - - - -
PCA	Condensation product of oxalate salt and ammonia	- - - - -

CYAGARD®	Ethylenebis[tris(2-cyano ethyl)] phosphonium Salt	CAS Reg. No.
RF-1	Bromide	10310-38-0

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

With regard to the use of the subject PYROSET® flame retardants in fabrics, American Cyanamid states that the tetrakis(hydroxymethyl) phosphonium salt flame retardants undergo significant chemical changes during the course of application. In general, fabric is passed through a bath containing flame retardant which has been pre-treated ("neutralized") with sodium hydroxide. The submitter reports that this neutralization "converts about 70 mole/percent of the quaternary [tetrakis(hydroxymethyl)] phosphonium compound to tris(hydroxymethyl) phosphine, formaldehyde, and the sodium salt of the counter-ion." The fabric, which is reported to pick up "solids" from the bath, is next substantially dried to a water content of 10-20 percent, and is then treated with ammonia vapor, which the submitter reports "converts adjacent hydroxymethyl groups to iminodimethylene linkages." After the ammonia treatment, the fabric is treated with hydrogen peroxide (or other oxidizing agent) which reportedly "oxidizes the trivalent phosphorus to the pentavalent state through the addition of an atom of oxygen." The material is then washed in water/detergent and dried. The submitter reports that although other types of treatment may be used on occasion, these also result in similar chemical changes to the flame retardant. The submitter states that following such treatments, "the finish on the fabric is far different chemically from the material that is applied." The submitter provided the results from several sponsored studies which were performed to determine the toxicity of flame retardant-treated fabrics which were either "oxidized" or "unoxidized". According to the provided results, neurotoxicity was observed only in rats which were fed (1% in the daily diet for five weeks) pulverized flame retardant-treated cotton cloth which was cured with ammonia but had not received the hydrogen peroxide wash (i.e. unoxidized).

The Chemical Hazard Identification Branch/AD/EPA prepared an earlier status report on acute in vivo neurotoxicity information, provided by the American Cyanamid Company on a "For Your Information (FYI)" basis (originally FYI-OTS-0780-0075), concerning its CYAGARD® RF-1 flame retardant product which is used in plastics for electrical and communication equipment. Based on a review and evaluation of that neurotoxicity data and the fact that the subject chemical is and has been in commerce, it was the Agency's preliminary determination that the information provided reasonable support for a conclusion of substantial risk of injury to health as defined in the Agency's March 16, 1978, "Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" (43 FR 11110) and should have been submitted by the American Cyanamid Company to the Agency at an earlier date pursuant to Section 8(e) of the Toxic Substances Control Act (PL 94-469). On August 8, 1980, American Cyanamid was requested to provide its rationale as to why the subject data on CYAGARD® RF-1 were not submitted earlier under Section 8(e) and was given an opportunity to rebut the Agency's preliminary determination on 8(e)-applicability. The American Cyanamid Company was also requested at that time to provide toxicological information on its PYROSET® TKO flame retardant product. The requested information was provided by American Cyanamid (FYI-OTS-0980-0369 Followup Response), and is the subject of the present status report.

Submission Evaluation

The initial American Cyanamid submission dealt with the flame retardant CYAGARD® RF-1, a compound which had both a bisquaternary structure and an amino alkylcyano analog structure. Bisquaternary compounds can cause skeletal muscle paralysis either by preventing the release of acetylcholine presynaptically at the neuromuscular junction or by the persistent depolarization of the muscle end-plate at that junction. Amino alkylcyano compounds also cause skeletal muscle paralysis, but by a different mechanism: damage to the spinal cord and cerebellum. American Cyanamid's followup response establishes that the tetrakis (hydroxymethyl) phosphonium compounds are neurotoxic in themselves and do not require the presence of an amino alkylcyano analog group. The provided test data show that the subject PYROSET® compounds are absorbed from the skin of rabbits and in some cases from the skin of rats and cats, and the gastrointestinal tract of rats. This absorption resulted in signs of neurotoxicity in rabbits, rats, and/or cats. The oral route of administration was 2 to 3 times as toxic as the dermal route. However, in two instances, the dermal route was shown to be more toxic than the oral. The differences between the salts of the tetrakis (hydroxymethyl) phosphoniums are quantitative rather than qualitative, depending on the particular salt tested and the route of exposure.

Most quaternary ammonium and bisquaternary ammonium compounds and their P, As, Sb, B and other analogs are feeble cholinesterase inhibitors. Therefore, it is not surpising that the hydroxymethyl phosphonium was not an active anticholinesterase, as demonstrated in the submitted studies.

With regard to human skin patch tests, neither the CYAGARD® RF-1 nor the tested PYROSET® compounds (which did not include PYROSET® TKO) were found to be sensitizing to human skin.

According to the submitter's description of the flame retardant application process, during the sodium hydroxide neutralization step, not all of the initial quaternary phosphonium compound is converted to the phosphine derivatives and by-products which include formaldehyde. Considering that the cloth picks up "solids" (undefined by the submitter) from the neutralization bath and is then only dried to a 10-20 percent water content, the possibility exists that residual unaltered (i.e. un-neutralized) quaternary phosphonium remains with the cloth at least to that point. The subsequent treatment of that residual compound with ammonia could lead to the formation of chemicals which are irritating and could retain neurotoxic properties which possibly may not be affected by the subsequent peroxide treatment. With regard to the phosphine derivatives (i.e. neutralized flame retardant) which are also picked up by the cloth, the ammonia treatment would most likely generate compounds which may be irritating but would not be expected to have neurotoxic properties. The addition of peroxide treatment in this case would be expected to bring about a further reduction in toxicity.

It should be noted that without a complete chemical analysis performed during the steps in the application process, it is not possible at this time to determine the actual chemical identities and amounts of the various compounds which may be formed during the process and are either discarded and/or are carried through the process and remain with the finished flame retardant-treated fabrics.

Current Production and Use

PYROSET® Products

A review of the production range (includes importation volumes) statistics for tetrakis(hydroxymethyl) phosphonium acetate (CAS No. 7580-37-2) and tetrakis(hydroxymethyl) phosphonium oxalate (PYROSET® TKS; CAS No.52221-67-7), which are listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data was claimed confidential by the manufacturer(s) and importer(s) and cannot be disclosed (Section 14(a) of the TSCA; U.S.C. 2613 (a)). **/

A review of the production range (includes importation volumes) statistics for tetrakis(hydroxymethyl) phosphonium chloride (PYROSET® TKC; CAS No. 124-64-1) which is listed in the initial TSCA Inventory, has shown that between 100 thousand and 1 million pounds of this chemical were produced/imported in 1977. **/

A review of the production range (includes importation volumes) statistics for tetrakis(hydroxymethyl) phosphonium sulfate (PYROSET® TKO; CAS No. 55566-30-8) which is listed in the initial TSCA Inventory, has shown that between 1.1 million and 11 million pounds of this chemical were produced/imported in 1977. **/

American Cyanamid reports that, of the above PYROSET® products, only PYROSET® TKO is currently a commercial product. According to the submission, the tetrakis(hydroxymethyl) phosphonium salts can be used as durable flame retardants in fabrics. The submitter also points out that it "sells other flame retardants under the PYROSET® trademark which do not belong to this class of compounds."

CYAGARD® Product

A review of the production range (includes importation volumes) statistics for ethylenebis[tris(2-cyanoethyl)] phosphonium bromide (CYAGARD® RF-1; CAS No. 10310-38-0), which is listed in the initial TSCA Inventory, has shown that between 10 thousand and 100 thousand pounds of this chemical were produced/imported in 1977.**/

American Cyanamid has reported that CYAGARD® RF-1 is sold in limited commercial quantities as a flame retardant in molded plastic parts in certain types of electrical component and communication equipment.

Comments/Recommendations

Following a review of the toxicity information on the tetrakis (hydroxymethyl) phosphonium salts, the EPA believes that the provided information should have been submitted at an earlier date pursuant to Section 8(e) of the Toxic Substances Control Act (PL 94-469). The basis for the EPA's position is as follows:

> The preface to Part V of the Agency's March 16, 1978, "Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" (43 FR 11110) states that a substantial risk of injury to health or the environment is a risk of considerable concern because of (a) the seriousness of the effect . . . and (b) the fact or probability of its occurrence." With regard to the seriousness of the effect, Part V explains further that the Agency considers the health effects for which substantial risk information must be reported to include "any pattern of effects or evidence which reasonably supports the conclusion that the chemical substance or mixture can produce . . . toxic effects resulting in death, or serious or prolonged incapacitation." The information respecting these effects can be obtained directly or inferred from designed studies (e.g. in vivo experiments and tests as described in Part VI of the policy statement). With regard to the "fact or probability of its occurrence" criterion, Part V also provides that certain health effects are so serious that relatively little weight should be given to the chemical's exposure in determining whether a risk is substantial. The mere fact that an implicated chemical is in commerce constitutes sufficient evidence of exposure.
>
> With regard to the reporting of substantial risk information, Section 8(e) of the Toxic Substances Control Act (TSCA) (90 Stat. 2029, 15 U.S.C. 2607), states in part that a person who obtains substantial risk information "must immediately inform the Administrator . . ." Part IV of the EPA's Section 8(e) policy statement of March 16, 1978, states that this obligation to report "immediately" is fulfilled if the EPA receives the information (via the reporting requirements specified in Part IX) within 15 working days after the date a subject manufacturer, processor, or distributor obtains such information. With regard to information first obtained by a subject person prior to the effective date of TSCA, Part VIII of the

Section 8(e) policy statement explains that any substantial risk information possessed by a person prior to January 1, 1977, of which that person is aware after that date, shall be reported to the EPA within 60 days of March 16, 1978.

In light of the in vivo neurotoxicological effects (which can result in serious or prolonged incapacitation or death) which were observed following exposure to the tested PYROSET® tetrakis (hydroxymethyl) phosphonium salts including the sulfate salt (PYROSET® TKO), and considering that at least one of the subject flame retardant compounds (PYROSET® TKO) is and has been in commerce, it is the Agency's preliminary determination that the information contained in the American Cyanamid Company's followup response provides reasonable support for a conclusion of substantial risk as defined in the EPA's March 16, 1978, Section 8(e) policy statement. In addition, it is the EPA's preliminary determination that the subject information should have been more properly submitted by the American Cyanamid Company to the EPA at an earlier date pursuant to TSCA Section 8(e).

In the cover letter to its followup response, American Cyanamid stated that it has reviewed the question of Section 8(e)-reportability in light of the Agency's comments on the data provided in the initial FYI submission on CYAGARD® RF-1 and does "not object to the delivery of the information contained in either submission [initial and followup] to the OPTS Document Control Officer for... filing as Section 8(e) substantial risk information." The submitting company also stated that it will take those EPA comments "into consideration in futur determinations of this type."

Following a review of the company's response and provided data, the Chemical Hazard Identification Branch delivered all information contained in FYI-OTS-0780-0075 and FYI-OTS-0980-0075 Followup Response to the OPTS Document Control Officer (DCO) for appropriate handling and public filing as TSCA Section 8(e) substantial risk information. The following substantial risk notice log numbers were assigned by the DCO: 8EHQ-0780-0369 and 8EHQ-0980-0369 Followup Response.

a) The American Cyanamid Company will be requested to describe the actions it has taken, in light of the reported toxicity data, to warn workers and others, and to reduce and/or eliminate exposure to the subject flame retardant chemicals.

b) The Chemical Hazard Identification Branch has revised its initial status report on CYAGARD® RF-1 to reflect the assigned TSCA Section 8(e) log number.

c) Tetrakis(hydroxymethyl) phosphonium sulfate (2:1) (PYROSET® TKO) is listed in the EPA's February 29, 1980 proposed TSCA Section 8(a) Level A rule (45 FR 13646). In light of the reported toxicity data, it is recommended that the other chemicals referenced in this status report be considered for inclusion in TSCA Section 8(a) Level A reporting.

d) The Chemical Hazard Identification Branch will transmit a copy of this status report to OSHA, NIOSH, FDA, CPSC, OWWM/EPA, and OE/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for distribution to EPA Regional Offices and State agencies, and to labor, environmental, and selected citizen groups. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and/or importers of the subject chemicals as listed in the Master TSCA Inventory, and to identified industry-associated groups.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: JAN 14 1981

SUBJECT: Status Report* 8EHQ-1080-0370

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

8EHQ-1080-0370
Page 1 of 3

Approved JM 1/27/81

Revision Needed

Submission Description

Exxon Chemical Americas has submitted a summary of preliminary results from a long term (lifetime) inhalation study of 1,3-butadiene (CAS No. 106-99-0) in male and female Sprague-Dawley rats. The study, which was sponsored by the International Institute of Synthetic Rubber Producers, involved inhalation exposure to 1,3-butadiene at concentrations of 0, 1000, and 8000 ppm for 6 hours/day, 5 days/week until the survival in any group reached between 20% and 25%. The submitter reported that the data obtained thus far indicate that there was an increase in mortality for both sexes at the 1000 and 8000 ppm dose levels. The submitter also reported that there appeared to be an increased incidence in total mammary tumors (benign plus malignant) in female rats exposed to 1000 or 8000 ppm. Male rats exposed to 8000 ppm reportedly showed an increased incidence in Leydig cell tumors (all benign) of the testes. The submitter also reported that there was a suggestion of tumor increases in several other organ systems of the test animals.

Exxon Chemical Americas stated that although it is not possible to draw definitive conclusions at present, "the data suggests (sic) an association between 1,3-butadiene exposure and increased tumor incidence for the test animals."

Submission Evaluation

As submitted, the data show that 1,3-butadiene is an oncogen. The complete analysis of the final data will probably establish 1,3-butadiene to be a carcinogen. Although the preliminary data indicate extensive organ distribution of tumors, it is of interest that the supportive or connective tissues appear to have been the targets in the uterus and brain.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

A review of the production range (includes importation volumes) statistics for 1,3-butadiene (CAS No. 106-99-0), which is listed in the initial TSCA Inventory, has shown that between 2.1 billion and 7.3 billion pounds of this chemical were produced/imported in 1977. **/

1,3-Butadiene is used as a raw material in the manufacture of synthetic rubber products and fibers.

Comments/Recommendations

The submitter reports that further results will be provided to the EPA upon completion of the study.

In 1974, OSHA set the current occupational standard for 1,3-butadiene exposure at an 8-hour time-weighted average (TWA) of 1000 ppm in air (39 CFR 23540). 1,3-Butadiene is listed in the EPA's February 29, 1980 proposed TSCA Section 8(a) Level A rule (45 FR 13546). 1,3-Butadiene is currently being tested for carcinogenicity (inhalation, mice) by the National Cancer Institute (NCI)/National Toxicology Program (NTP).

a) The Chemical Hazard Identification Branch (CHIB/AD) will request the submitting company to describe the actions it has taken, in light of the provided toxicity data, to warn workers and others, and to reduce and/or eliminate exposure to 1,3-butadiene.

b) CHIB will consider the preparation of a Chemical Hazard Information Profile (CHIP) on 1,3-butadiene. ("Butadiene and Its Oligomers" was the subject of a previous (December, 1978) hazard assessment (EPA 560/2-78-008) which is available through the National Technical Information Service (NTIS) in Springfield, Va.).

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to OSHA, NIOSH, CPSC, FDA, NCI/NTP, and OWWM/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for distribution to EPA Regional Offices.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

and State agencies, and to labor, environmental, and selected citizen groups. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and/or importers of 1,3-butadiene as listed in the Master TSCA Inventory, and to identified industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1180-0371
Page 1 of 2

DATE: JAN 22 19

SUBJECT: Status Report* 8EHQ-1180-0371

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Approved JM 1/27/81

Revision Needed ______

Submission Description

Lever Brothers Company, Inc. has reported that under the conditions of a recently performed in vivo study, a commercial product identified as VARISOFT 222(90%) was found to be a potent skin sensitizer in guinea pigs. The submitter reported that this product is supplied by the Sherex Chemical Corporation and is described as being a complex difatty quaternary for use in liquid fabric softener systems. Lever Brothers stated that its interest in VARISOFT 222(90%) for use in household products could have possibly constituted a new use by the public and therefore an increase in the general exposure. In submitting this information to the EPA under Section 8(e), Lever Brothers stated that it believes that the preliminary data derived from the performed study "reasonably supports our [the company's] contention that this material could possibly pose a substantial risk to humans upon repeated exposure."

Note: In the initial submission, Lever Brothers reported that the Sherex Chemical Corporation was a subsidiary of the Ashland Chemical Corporation. However, the Ashland Chemical Corporation has reported (8EHQ-0181-0371 Supplement) that Sherex is a subsidiary of Schering A.G. of West Germany.

Submission Evaluation

VARISOFT 222(90%), which is described as a "complex difatty quaternary," may be related to the dialkyl cetyl ammonium complexes which are used as cationic detergents. Some compounds of this type are known to be skin irritants and sensitizers. Efforts should be made to obtain the name(s) and amount(s) of the actual chemical component(s) of VARISOFT 222(90%) from its manufacturer.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

VARISOFT 222(90%) is not listed as such in the initial TSCA Inventory. The submitting company did not provide any information on the current production/importation volumes of the product nor was that information located in the secondary literature sources consulted.

As previously stated, Lever Brothers reported that VARISOFT 222 (90%) is used in liquid fabric softener systems. No other information on the use(s) of VARISOFT 222(90%) was located in secondary literature sources consulted.

Comments/Recommendations

Lever Brothers reported that it had informed the Sherex Chemical Corporation of the test results and also of Lever Brothers' intention to submit a Section 8(e) notice. Lever Brothers also reported that on the basis of those test data, the company will probably not continue further development of a product containing VARISOFT 222(90%).

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the manufacturer of VARISOFT 222(90%) to provide information concerning the actual identity (including CAS Number(s)) and amount(s) of the chemical component(s) of the product.

b) CHIB will transmit a copy of this status report to both the submitting company and the manufacturer of VARISOFT 222(90%). In addition, CHIB will transmit a copy of the status report to NIOSH, OSHA, CPSC, and OWWM/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for distribution to EPA Regional Offices and State agencies, and to labor, environmental, and selected citizen groups.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: JAN 14

SUBJECT: Status Report* 8EHQ-1180-0372

Approved JM 1/27/81

Revision Needed ______

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Callery Chemical Company has submitted a summary of results from acute dermal toxicity and ocular irritation studies (rabbits) of dimethylsulfide borane (CAS No. 13292-87-0). According to the provided summary, a dose of 200 mg/kg body weight applied to intact or abraded skin for 24 hours caused death in 5/10 animals shortly after exposure. With regard to the ocular irritation study, an 0.1 ml sample was placed into the lower conjunctival sac in one eye of each of 6 rabbits. The eyes were irrigated with water after 24 hours and the eyes were examined. Signs of irritation/damage (i.e. corneal opacity, injected iris, slight conjunctival redness and swelling) were observed and were found to improve slightly by the seventh day of post-exposure observation. The submitter stated that in "the event of a spill or accident, dimethylsulfide borane can present a risk to unprotected persons."

Submission Evaluation

Dimethylsulfide borane appears to be a highly toxic, lethal chemical which is readily absorbed from the skin. It would be important to have a description of the signs of intoxication that preceded the death of the rabbits. The reported deaths could have been due to either respiratory or cardiovascular failure. Death could have also been due to central nervous system effects such as occur with decaborane which releases norepinephrine in the cerebral cortex.

Current Production and Use

A review of the production range (includes importation volumes) statistics for dimethylsulfide borane (CAS No. 13292-87-0), which is listed in the initial TSCA inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a)).**/

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

No information on the use(s) of dimethylsulfide borane was provided by the submitter nor located in the secondary literature sources consulted.

Comments/Recommendations

The Agency's interest in receiving the results of acute animal toxicity studies pursuant to Section 8(e) of TSCA is, in general, fairly limited. Under certain circumstances, however, the results of such range finding studies can provide reasonable support of a conclusion of substantial risk. Clarification of this point can be found in the EPA's March 16, 1978 "Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" (43 FR 11110), Appendix A, part D, Comment 14.

a) The Chemical Hazard Identification Branch (CHIB/AD) will request the Callery Chemical Company to provide complete copies of the test protocols, data, results of necropsy (if performed), and cage-side observations (if any) from the studies cited in its submission. The submitting company will also be requested to describe the actions it has taken, in light of the provided toxicity data, to warn workers and others, and to reduce and/or eliminate exposure to dimethylsulfide borane. In addition, the company will be asked if it plans to conduct any additional testing in order to further define the toxicity of dimethylsulfide borane.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH and OSHA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for distribution to EPA Regional Offices and State agencies, and to labor, environmental, and selected citizen groups. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and/or importers of the subject chemical as listed in the Master TSCA Inventory, and to identified industry-associated organizations.

**/ The data submitted for the TSCA Inventory including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: APR 21 1981

SUBJECT: Status Report* 8EHQ-1180-0373S
8EHQ-1180-0374S
8EHQ-0281-0373S Supplement
8EHQ-0281-0374S Supplement

Approved 5/14/81

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The 3M Company has submitted preliminary reports with test protocols and the final reports of a teratology study in rats with 1) a mixture of N-ethyl perfluorooctylsulfonamido ethanol and N-ethyl perfluoroheptylsulfonamido ethanol (8EHQ-1180-0373S; 8EHQ-0281-0373S Supplement) and 2) FC-95, a commercial mixture of perfluoroalkylsulfonic acid potassium salts (8EHQ-1180-0374S and 8EHQ-0281-0374S Supplement). In addition, submission 8EHQ-1180-0374S contains a 3M technical report entitled "Analysis of Selected Decatur Employee Serum for Sulfonic and Carboxylic Fluorochemicals".

According to the submitted protocols, the tested mixtures were administered via oral intubation to sexually mature, time-mated female rats on days 6 through 15 of gestation. Animals were assigned to groups receiving 0, 1, 5 or 10 mg/kg/day of the potassium salt derivative mixture or 0, 25, 37.5 or 75 mg/kg/day of the perfluoroethanol derivative mixture.

The final teratology reports (8EHQ-0281-0373S Supplement and 8EHQ-0281-0374S Supplement) state that both test mixtures produced a "developmental eye abnormality which appeared to be an arrest in development of the primary lens fibers forming the embryonal lens nucleus, followed by secondary aberrations of the secondary lens fibers of the fetal nucleus". According to the final reports, this effect was observed in all three dose groups administered FC-95 (significant in the high dose group) and was significantly higher than controls in all three dose groups administered the mixture of perfluoroethanol derivatives. The final reports further state that, while FC-95 did not produce an increase in skeletal abnormalities, the mixture of perfluoroethanol derivatives produced cleft palates in the high and mid dose groups (significant in the high dose group), blood in the fetal kidney parenchyma in all three dose groups (significant in the high dose group), and malformations in fetal sternebrae and other skeleton aberrations of varying significance at the different dose levels. The final reports also state that FC-95 at the high dose and the perfluoroethanol derivative mixture at the high and mid doses were maternally toxic in reducing weight gain during dosing, but did not affect the ovaries or reproductive tract contents of the dams and were not embryotoxic.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

In the submitted 3M technical report, it is stated that fluorochemicals have been detected in the blood of 3M employees. According to that 3M report, the five highest fluorine-containing serum samples among ten selected plant employees contained three fluorochemicals with total levels ranging from 4.1 to 11.8 ppm.

The submitter also states that according to employee records and a recent study conducted by the 3M Company which was published in the American Industrial Hygiene Association Journal (Vol. 41:584-589, August, 1980) "to date no human health problems have been observed nor disease patterns detected which are attributable or related to fluorochemical exposure". This published study, entitled "Health Status of Plant Workers Exposed to Fluorochemicals - A Preliminary Report," contains information on fluorochemical levels both in the blood of fluorochemical plant workers and in workplace ambient air, as well as the results of employee health screening examinations and a retrospective epidemiological investigation of plant employees. The published study indicates that analysis of fluorine levels in the blood of ammonium perfluorooctanoate production workers showed that although inorganic fluorine levels were comparable to normal human sera, organic fluorine levels ranged from 1.00 to 71.00 ppm, compared to 0.01 to 0.13 ppm for normal human sera. The published report also states that one worker with elevated organic fluorine in the blood was moved to a fluorochemical-free plant location and monitored for blood and urine fluorine at regular intervals. Over an 18 month period, the serum organic fluorine levels in this worker reportedly decreased from 70 to 39 ppm, and levels of perfluorooctanoate in the urine (24 hour collections) decreased from 387 to 80 micrograms over the first 14 months of this period. The report states that these blood and urine values "suggest that some fluorochemicals are very slowly eliminated in humans".

According to the same published 3M study, the results of 3M employee medical examinations, which included liver function profiles, showed no relationship between test result deviations and blood levels of organic fluorine. The most frequently encountered liver enzyme exceeding the normal range among a sample of all plant employees was serum gamma-glutamyltransferase (SGGT). However the 3M study states that these deviations "were most likely unrelated to plant work and are compatible with the individuals' predisposition toward alcohol".

The 3M published study also states that a retrospective cohort mortality study of plant employees covering a 30 year period from 1948 to 1978 indicated no disagreement between observed and expected mortality among employees in general or chemical workers in particular. The report states further that this finding was true for all causes of death and specific causes of death due to cancer.

In the same publication, it is reported that ammonium perfluorooctanoate was negative in the Ames test both with and without metabolic activation. The target organ of this same substance in rodents was reported to be the liver, where a more pronounced histopathological effect was observed in males than in females. The published report also states that the major site of toxicity in the rhesus monkey appeared to be the reticuloendothelial system. The published report states that details of these studies are presented in a separate publication. However, this separate publication was not cited.

According to the 3M published report, air monitoring in the operator's breathing zone indicated fluorochemical levels up to 3.27 mg/m^3 during fluorochemical processing and packaging operations, but that this level has been reduced to 0.47 mg/m^3 by instituting appropriate modifications which were described in the report.

Submission Evaluation

The final reports provided in submissions 8EHQ-0281-0373S Supplement and 8EHQ-0281-0374S Supplement furnish detailed teratology data for the subject mixtures, both of which contain organofluorine compounds and produce malformations during fetal development, particularly failure of the eye lens to develop normally. Such failure occurs rarely. These submissions report for the first time that this type of teratogenic effect can be induced by exogenous chemicals. Additional research with these fluorochemical mixtures appears to be needed to determine the mechanism of lens teratogenesis.

The 3M sponsored epidemiology study reported in the American Industrial Hygiene Association Journal appears to be too general for detecting slowly developing clinical toxicity resulting from exposure to special classes of organic compounds. The interesting data in this published report are that 1) workers exposed to the perfluoro compounds can absorb them, as indicated by blood and urine levels, and 2) the one worker studied for several months after exposure had been terminated still had organic fluorine in the blood at 18 months and was still excreting perfluorooctanoate in the urine at 14 months. (It should be noted that fecal elimination was not monitored). The blood level of organic fluorine had decreased to approximately one half, and the urine level of perfluorooctanoate by approximately 80%. This finding indicates a blood half-life of at least one and one-half years. The provided data do not permit a determination of whether there is firm bonding with plasma proteins or whether there is continuous release from depot stores in the body. Firm bonding is suggested by the increasing ratio of serum levels of organic fluorine to urinary levels of perfluorooctanoate, as though less and less of the amount in the blood can be excreted by the kidneys. This ratio of organic serum in the blood to perfluorooctanoate in the urine increased from 17 at one week post-exposure to 55 at 14 months post-exposure. The data also suggest that the perfluoroates are picked up by macrophages, stored in the reticuloendothelial system (liver, spleen, lungs, lymphatic structures and possibly the kidneys) and slowly released into the blood. These suggestions can be answered only by experiments on animals. The reported determinations on the studied employee did not include blood and urine levels of inorganic (ionized) fluorine.

It should be pointed out that although fluorine compounds affect bone, teeth and enzymes involved in blood clotting and thyroid gland functions, the published 3M report did not contain data pertaining to these parameters. The consulting hepatologist cited in this same published report may have been correct in assuming that the slightly elevated SGGT reflected "dispositions of the subjects to alcohol". However, no corroborating data were presented, nor was the possibility of storage in the liver considered. It appears that comprehensive animal studies on the pharmacokinetics and tissue levels of the subject chemicals in the reticulo-endothelial system are needed. Also, levels of organic and inorganic fluoride in the blood and urine, dental examinations and x-ray examination of bones for signs of fluorosis for each exposed person would allow a more complete evaluation of worker health status.

Current Production and Use

A review of the production range (includes importation volumes) statistics for N-ethyl perfluorooctylsulfonamido ethanol (CAS No. 1691-99-2), which is listed in the initial TSCA Inventory, has shown that between 100,000 and 1,000,000 pounds of this chemical were produced/imported in 1977. **/

A review of the production range (includes importation volumes) statistics for N-ethyl perfluoroheptylsulfonamido ethanol (CAS No. 68555-73-7), which is listed in the initial TSCA Inventory has shown that between 10,000 and 100,000 pounds of this chemical were produced/imported in 1977 **/

The submitter states that the mixture of the above two chemicals is used as an intermediate in the production of various finished fluorochemical products. The actual identity of this intermediate has been claimed by the submitter as "Confidential Business Information".

FC-95 is identified by the submitter as FLUORAD® Brand Fluorochemical Surfactant, a mixture containing potassium salts of homologous perfluoroalkyl sulfonates. The components of this mixture and their combined production volume have been claimed by the submitter as "Confidential Business Information".

The submitter states, in 8EHQ-1180-0374S, that this homologous mixture (or the corresponding ammonium salts) is currently sold as various products containing from 100 percent "solids" to 0.58 percent of the mixture. These products and their customer uses are described in the submission as follows:

FLUORAD® Brand Fluorochemical Surfactant, FC-95	Chrome Plating
FLUORAD® Brand Etching Bath Additive FC-93 (corresponding ammonium salt of the subject chemical)	Electronic Manufacturing
FLUORAD® Brand Fluorochemical Surfactant, FC-99 (corresponding amine salt of subject chemical)	Chrome Plating

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**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

LIGHT WATER® Brand Aqueous Film Forming Foam FC-203	Fire Suppression
LIGHT WATER® Brand Aqueous Film Forming Foam FC-203A	Fire Suppression
LIGHT WATER® Brand Aqueous Film Forming Foam, FC-206A	Fire Suppression
LIGHT WATER® Brand Aqueous Film Forming Foam Alcohol Type Concentrate, FC-600	Fire Suppression
AFFF 6% Concentrate, FC-780B	Fire Suppression

No other information on current production volumes or uses of FC-95 were located in the secondary sources consulted.

Comments/Recommendations

The 3M Company states that it plans to inform all customers and employees with significant exposure potential to the subject chemicals of the teratology study findings and to outline 3M's recommendations for handling and using these products. The submitter also states that copies of these submissions are being transmitted to NIOSH and that the following work is planned for initiation in the near future: 1) a second teratology study designed to further evaluate these findings in both rats and rabbits; 2) lifetime feeding studies in rats; 3) development of industrial hygiene procedures designed to further reduce exposure to plant employees.

The EPA has evaluated a previous 3M submission (8EHQ-1077-0011) in which it was reported that FC-70, a commercial product used as an electronics vapor soldering fluid, decomposes to highly toxic perfluoroisobutylene and an unidentified perfluoroimine when overheated.

a) The 3M Company will be asked if it plans to conduct further monitoring studies (e.g., organic and inorganic fluoride levels in the blood and urine, dental examination and x-ray examinations of bones for signs of fluorosis) of employees potentially exposed to the subject chemicals.

b) The 3M Company will be requested to provide bibliographic citations for the mutagenicity and target organ studies in rodents and monkeys cited and summarized in the 3M report published in the American Industrial Hygiene Association Journal which is referenced in the original submissions.

c) It is recommended that the chemicals referenced in this status report be considered for inclusion in TSCA Section 8(a) Level A reporting.

d) The Chemical Hazard Identification Branch will consider the preparation of Chemical Hazard Information Profiles on selected chemicals within the class of perfluoroalkylsulfonates.

e) The Chemical Hazard Identification Branch will transmit a copy of this status report to OSHA, NIOSH, CPSC and OWWM/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/EPA) for appropriate distribution. The Industry Assistance Office (IAO/EPA) should consider sending the same information to the manufacturers and/or importers of the subject chemicals as listed in the Master TSCA Inventory, and to identified industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1180-0375S
Page 1 of 2

DATE: JAN 15 198

SUBJECT: Status Report* 8EHQ-1180-0375S

Approved JM 1/27/81

Revision Needed ______

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

Tenneco Chemicals, Inc. submitted a summary of preliminary data from a rat dermal application study of a mixture of the cadmium salts of para-tertiary-butylbenzoic acid and benzoic acid. (The submitter has claimed the actual identities and amounts of the applied mixture components to be Confidential Business Information). According to the submitter, a single high level dermal exposure to the mixture (in an appropriate vehicle) produced testicular damage in the rats.

The submitting company stated that this dermal application study in rats was undertaken following receipt of information that para-tertiary-butyl benzoic acid caused testicular damage in laboratory animals.

Submission Evaluation

It appears that the applied mixture of cadmium salts was absorbed through the skin and resulted in damage to the testicles. This observation confirms, in part, reports in the literature that para-tertiary-butyl benzoic acid causes such damage when fed to rats. It is also well established that acute cadmium poisoning can cause testicular damage in rats.

Further evaluation of the submitter's findings will have to await the EPA's receipt of complete copies of the experimental protocols(s) and data obtained from the cited rat dermal application study.

Current Production and Use

In light of the submitter's claim of confidentiality for the actual chemical identities and amounts of the components in the applied mixture, the review of the production volumes of the mixture itself and its specific components will not appear in this status report. The submitter did not provide any information on the uses of the tested mixture, nor was such information located in the secondary literature sources consulted.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Comments/Recommendations

Tenneco Chemicals, Inc. reports that "steps are being taken to insure elimination of workers' potential direct contact with this chemical substance." (The exact nature of those steps have been claimed as confidential by the submitter).

The National Institute for Occupational Safety and Health (NIOSH) has published a "Criteria Document" on cadmium. EPA's Carcinogen Assessment Group (CAG/ORD) has also evaluated this chemical. In addition, the Chemical Review and Evaluation Branch (CREB/AD/EPA) has completed an in-depth source and health/environmental effects assessment (Phase I) for cadmium. Cadmium is currently included in the EPA's list of 129 Priority Pollutants.

a) The Chemical Hazard Identification Branch (CHIB/AD) will request the submitting company to provide a complete copy of the final results, including test protocols and data, from the rat dermal application study cited in its submission.

b) CHIB will transmit a copy of this status report to NIOSH, OSHA, OWWM/EPA, ORD/EPA, and CREB/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for distribution to the EPA Regional Offices and State agencies, and to labor, environmental, and selected citizen groups.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: JAN 27 1981

SUBJECT: Status Report * 8EHQ-1280-0376

Approved JM 1/27/81

Revision Needed ______

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Stepan Chemical Company has reported that two nitrosamines have been identified as contaminants in an alkyl amine oxide. Specifically, the submitter reports that by using a thermal energy analysis (TEA) technique, a sample of lauryl dimethylamine oxide (CAS No. 1643-20-5) was found to contain 2.1 ppm N-nitrosodimethylamine (CAS No. 62-75-9) and 6.1 ppm N-nitrosomethyldodecylamine (CAS No. 55090-44-3). The finding of N-nitrosodimethylamine was reportedly confirmed by using another analytical technique (GCMS).

The Stepan Chemical Company reports that lauryl dimethylamine oxide is a surfactant used in formulated shampoos and household detergent products. The submitter also reports that "the data indicate that a product formulated with these materials at a typical 4% level could contain 10 to 80 parts per billion of dimethylnitrosamine. Since a representative usage concentration of such a formulated product is in the range of 0.10%, the exposure level of the ultimate consumer could be in the range of 0.010 to 0.080 parts per billion."

It is the submitter's stated belief that "the manufacture or use of [lauryl dimethylamine oxide] or its use in cleaning products at the levels determined" does not represent a substantial risk. However, in making this report pursuant to TSCA Section 8(e), the Stepan Chemical Company states that it does understand that "certain nitrosamines, including N-nitrosodimethylamine, have been recognized by the USEPA as suspected carcinogens...."

Submission Evaluation

Dimethylnitrosamine has been shown to be carcinogenic in all animals species (over 20 species) tested to date, including the guinea pig (which is refractory to the carcinogenic effect of

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

highly potent azo dyes and aromatic amines), as well as sub-human primates. The carcinogenic effects of higher dialkylnitrosamines and more complex (e.g. cycloalkyl and alkylaryl) nitrosamines are also well known. However, these compounds have been far less extensively studied than dimethylnitrosamine. (N-Nitrosomethyldodecylamine belongs to the category of asymetric higher nitrosamines). The target specificity of the various nitrosamines covers a wide range of tissues and organs. As with other carcinogens, the target tissues/organs for any particular nitrosamine may vary from species to species.

Human tissues rapidly metabolize nitrosamines, in particular dimethylnitrosamine, and have been shown to generate from the latter compound an activated mutagenic agent. The discovery of dimethylnitrosamine as a carcinogen has been linked to the observation that the compound is a potent hepatotoxic agent in humans at low exposure levels. It has also been established (in rodents) that the hepatotoxicity is the preliminary stage of the neoplastic transformation in the liver. Two recent forensic cases have reaffirmed the potent hepatotoxicity of dimethylnitrosamine in humans. Although there are no epidemiological data as yet on the carcinogenicity of nitrosamines in humans, based on the existing evidence, these chemical substances should be regarded as potential human carcinogens.

There is experimentally-supported reason to conclude that no threshold dose for carcinogenicity can be assumed, at least in the cases of dimethyl- and diethylnitrosamine. In fact,the metabolism of these two compounds consists of a one-step pathway which represents an activation process for both mutagenicity and carcinogenicity. It should also be pointed out that no detoxification pathway for the above nitrosamines has been discovered during 26 years of investigation. Consequently, any level of these less complex nitrosamines can be expected to give rise to an equimolar level of mutagenic/carcinogenic agents in humans.

In commercial products, nitrosamine contaminants may originate as by-products formed during the manufacturing process or, as in the case of complex mixtures (e.g. cutting fluids), nitrosamines may arise and increase in concentration as the result of chemical interaction of certain chemical components during storage. In the case of single compounds, such as lauryl dimethylamine oxide, the nitrosamine contaminants could represent by-products of the synthesizing process or possibly impurities of the starting materials used in that process. It is important to note that under these circumstances, the levels of contaminating nitrosamines could be very substantially reduced by appropriate change(s) in the manufacturing process and/or careful monitoring (i.e. chemical analysis) of the purity of the feedstocks used in the process.

Current Production and Use

A review of the production range (includes importation volumes) statistics for lauryl dimethylamine oxide (CAS No. 1643-20-5), which is listed in the initial TSCA Inventory, has shown that between 11 thousand and 112 thousand pounds of this chemical were produced/imported in 1977.**/

The submitter reports that lauryl dimethylamine oxide is a surfactant which is manufactured by a number of companies and is used in shampoos and household detergent formulations. No further information on the use(s) of the chemical was provided by Stepan or was located in the secondary literature sources consulted.

A review of the production range (includes importation volumes) statistics for N-nitrosodimethylamine (CAS No. 62-75-9), which is listed in the initial TSCA Inventory, has shown that between 0 and 2 thousand pounds of this chemical were produced/imported in 1977. **/

According to secondary literature sources, N-nitrosodimethylamine was used (prior to 1976) in the United States as an intermediate in the production of 1,1-dimethylhydrazine liquid rocket fuel. The chemical is apparently now only used for research purposes.

N-Nitrosomethyldodecylamine (CAS No. 55090-44-3) is not listed in the initial TSCA Inventory. No information was located on the use(s) of this chemical substance.

Comments/Recommendations

The International Agency for Research on Cancer (IARC) has found that there "is sufficient evidence of a carcinogenic effect of N-nitrosodimethylamine in many experimental animal species. Similarities in its metabolism by human and rodent tissues have been demonstrated. Although no epidemiological data were available [to the IARC workgroup]...N-nitrosodimethylamine should be regarded for practical purposes as if it were carcinogenic to humans" (IARC Monograph; Vol. 17; May, 1978). Since 1974, N-nitrosodimethylamine has been regulated by OSHA as a carcinogen (39 CFR 3756). According to the NIOSH Registry of Toxic Effects of Chemical Substances (RTECS;1979), N-nitrosomethyldodecylamine has also been shown to be carcinogenic in laboratory animals.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Lauryl dimethylamine oxide and N-nitrosodimethylamine are listed in the EPA's February 29, 1980 proposed TSCA Section 8(a) Level A rule (45 FR 13646).

The Procter and Gamble Company recently informed (January 8, 1981) the Chemical Hazard Identification Branch/AD that the company is currently testing lauryl dimethylamine oxide and reported that the information submitted by the Stepan Chemical Company under Section 8(e) of TSCA will be considered in the quality control program for the conduct of that study. Procter and Gamble also reported that the National Cancer Institute (NCI) is aware of the ongoing testing and has reviewed the company's protocols.

The EPA has received and evaluated several other Section 8(e) submissions on nitrosamines: 8EHQ-0012, 0133, and 0294. (These numbers represent the last four digits of the EPA's Document Control number assigned to the submission).

a) The Chemical Hazard Identification Branch (CHIB/AD) will request the Stepan Chemical Company to describe the actions it has taken, in light of the provided information on nitrosamines, to warn workers and others, and to reduce and/or eliminate exposure to the subject chemical substances.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, NCI/NTP, OWWM/EPA, the Interagency Regulatory Liason Group(IRLG) workgroup on nitrosamines, and to the Procter and Gamble Company. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for distribution to EPA Regional Offices and State agencies, and to labor, environmental, and selected citizen groups. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and/or importers of lauryl dimethylamine oxide as listed in the Master TSCA Inventory, and to identified industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0181-0377
Page 1 of 4

DATE: JAN 27 1981

SUBJECT: Status Report* 8EHQ-0181-0377

Approved 2/24/81

Revision Needed ______________

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Atlantic Richfield Company has reported that upon repeated dermal application to rabbits, Jet Fuel A, No. 6 Heavy Fuel Oil (API Gravity 5.2/1.2%S), and No. 6 Heavy Fuel Oil (API Gravity 23.1/0.2%S) each produced an apparent compound-related increase in the incidence of hyperplasia of the urinary bladder epithelium. The submitter reported that these studies (sponsored by the American Petroleum Institute) involved the dermal application of the test chemicals for five consecutive days followed by a two day rest period with another five day application followed by a two day rest period. According to the submitter, observations for mortality and local reactions were made during the 14-day test period. Following the test period, microscopic examination of the urinary bladders reportedly revealed hyperplasia.

In reporting these toxicological findings under Section 8(e) of TSCA, the submitter stated that there are several factors which indicate that the increased incidence of urinary bladder hyperplasia may not be due to the dermal application of the tested chemicals. Specifically, the submitter stated that:

"1. The small number of control animals used may not have been indicative of the true incidence of bladder hyperplasia in untreated animals.

2. Because of the high doses used, many of the animals died after only a few days exposure to the test material. This limited time on test would appear to be too short for the development of hyperplasia of the bladder epithelium.

3. The tissue sampling techniques used at necropsy were not standardized. This difference in techniques may have resulted in apparent increased thickness of normal bladder epithelium. Examples of these non-standardized

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

> techniques included: the site of the bladder from which tissue was sampled was not the same in all animals; and the fact that some bladders were inflated with fixative before sampling, while others were not."

The Atlantic Richfield Company also pointed out that it had previously submitted a Section 8(e) notice on Jet Fuel A (8EHQ-1279-0323). In that earlier submission, Atlantic Richfield provided a complete copy of the final results from a number of *in vitro* and *in vivo* mutagenicity studies of Jet Fuel A. At that time, the submitter reported that this fuel did not exhibit a positive response in the Ames test either with or without metabolic activation. However, Jet Fuel A was reportedly found to induce mutations in the *in vitro* mouse lymphoma assay (in the presence of metabolic activation), and found to produce bone marrow cell mutations in an *in vivo* cytogenetics study.

Submission Evaluation

At an 8 ml/kg dose (only dose tested), Jet Fuel A produced significant skin toxicity of some degree in all of the rabbits to which it was applied dermally. According to the laboratory report, the compound also produced hyperplasia of the transitional epithelium in the urinary bladder of 3 of the 8 tested rabbits. Six of the 8 treated rabbits died during the course of the experiment and 6 of the 8 animals were observed to have some degree of liver injury. The performing laboratory conclusion with regard to the experiment with Jet Fuel A was that the effects observed were treatment related.

At an 8 ml/kg dose (only dose tested), No. 6 Heavy Fuel Oil (API Gravity 23.1/0.2%S) resulted in the deaths of 2 of 8 rabbits to which it was dermally applied. All of the treated animals were observed to have severe skin changes. Four of 8 rabbits were found to have proliferative changes in the transitional epithelium of the urinary bladder and 7 of 8 had liver injury. The performing laboratory reported the observed toxicological effects to be treatment related.

No. 6 Heavy Fuel Oil (API Gravity 5.2/1.2%S) induced inflammatory changes at the site of skin application at all doses tested (1.0, 2.0, and 2.5 ml/kg) in the rabbits. Fourteen of 16 animals receiving the highest doses (2.0 and 2.5 ml/kg) were reported to have multifocal necrosis of the liver. One animal receiving the highest dose was found to have hyperplasia of the transitional epithelium of the urinary bladder.

Based on the findings of the performed studies, there is little doubt that the three tested petroleum products result in severe toxicity when applied to the skin. It is significant that hyperplasia of the transitional epithelium of the urinary bladder occurred only in the treated animals. The submitter's suggestion that the observed toxicological effects were not compound treatment related would require further experimentation in light of the actual laboratory findings and the opinions expressed by the performing laboratory. In addition, a more precise characterization of the volume percent of polynuclear hydrocarbons (some of which may be carcinogens) present in the tested fuels would appear to be necessary.

Current Production and Use

In submission 8EHQ-1279-0323, the Atlantic Richfield Company reported that Jet Fuel A is a complex petroleum product which is sold to airline companies for use as jet airplane fuel. Although there is no one CAS number used to identify the possible available mixtures and treatment processes for this product, the submitter did provide the results of a mass spectrometry analysis. Jet Fuel A, as such, is not listed in the initial TSCA Inventory.

According to the TSCA Inventory, No. 6 Fuel Oils are petroleum fuel oils having a minimum viscosity of 900 SUS and a maximum viscosity of 9000 SUS at 100°F. A review of the production range (includes importation volumes) statistics for No. 6 Fuel Oils (CAS No. 68553-00-4), which are listed in the initial TSCA Inventory, has shown that over 1 billion pounds were produced/imported in 1977. **/

Comments/Recommendations

Complete copies of the final results, including test protocols and data, from the acute rabbit dermal application studies cited by Atlantic Richfield in 8EHQ-0181-0377, were provided to the EPA by the American Petroleum Institute (API).

The Agency has prepared status reports for a number of TSCA Section 8(e) submissions received on synthetic and petroleum fuels: 8EHQ-0029, 0030, 0044, 0082, 0083, 0117, 0148, 0212, 0215, 0216, 0217, 0238, 0240, 0247, 0252, 0253, 0297, 0301, 0306, 0316, and 0323. (These numbers represent the last four digits of the Document Control Officer assigned numbers).

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Atlantic Richfield Company to describe

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**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

the actions it has taken, in light of the submitted toxicity information, to warn workers and others, and to reduce and/or eliminate exposure to the subject fuels.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to DOE, OSHA, NIOSH, OWWM/EPA, ORD/EPA, and the American Petroleum Institute. CHIB will also provide copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for distribution to EPA Regional Offices and State agencies, and to labor, environmental, and selected citizen groups. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and/or importers of the subject chemicals listed in the Master TSCA Inventory, and to industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0181-0378
Page 1 of 2

DATE: JAN 30 19[illegible]

SUBJECT: Status Report* 8EHQ-0181-0378

Approved 7/20/81

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

Pursuant to TSCA Section 8(e), the International Minerals & Chemical Corporation has submitted a written report concerning an "Emergency Incident of Environmental Contamination" involving an accidental release of sulfur dioxide (SO_2; CAS No. 7446-09-5) from one of its subsidiary's sulfuric acid manufacturing facilities. In accordance with the EPA's March 16, 1978, Section 8(e) policy statement ("Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk; 43 FR 11110), the submitting company's written report follows its telephoned Section 8(e) notification of EPA's Region IV Office in Atlanta, Georgia. According to the provided written report, the sulfur dioxide release (lasting 5 to 7 minutes) resulted from a malfunctioning vibration monitoring device which caused an emergency shutdown of the plant. The submitter reports that a number of on-site construction workers were hospitalized and subsequently released. The submitter also reports that restart of the plant operation within 7 minutes corrected the sulfur dioxide release situation immediately.

Submission Evaluation

Sulfur dioxide is a strong irritant to the mucous membranes of the eyes, nose, and upper respiratory tract (trachea and bronchi). However, the chemical rarely produces edema of the glottis and lungs. Short term human exposure to high concentrations of sulfur dioxide from which escape is possible is usually followed by prompt recovery (i.e. no after effects), except in the case of asthmatics.

Current Production and Use

Based on the nature of this submission, a report on the current production and uses of sulfur dioxide does not appear to warranted at this time.

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Comments/Recommendations

In 1974, the Occupational Safety and Health Administration (OSHA) established the current occupational standard for sulfur dioxide exposure at an 8 hour time-weighted average (TWA) of 5 ppm (39 CFR 23540). In addition, the National Institute for Occupational Safety and Health (NIOSH) has prepared a "Criteria Document" on sulfur dioxide.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will provide a copy of this status report to OANR/EPA and to the EPA's Region IV Office for inclusion in its file on this reported release of sulfur dioxide.

b) CHIB will also provide a copy of the status report to the EPA's Office of Hazardous Emergency Response (OHER/OWWM).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 3

DATE: MAR 26 1981

SUBJECT: Status Report* 8EHQ-0181-0379
8EHQ-0381-0379 Supplement

Approved JM 9/19/81

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

In its initial submission, Exxon Chemical Americas (a division of Exxon Chemical Company, a division of the Exxon Corporation) submitted a summary of the final results of a 28-day rabbit dermal application study of two non-commercial substances within the class of zinc dialkyldithiophosphates (ZDDPs). The submitter reported that the zinc salt of phosphorodithioic acid, (secondary butyl and isooctyl) mixed esters, and the zinc salt of phosphorodithioic acid, O,O'-di(isohexyl, isoheptyl, isooctyl, isononyl, isodecyl) mixed esters were each found to cause aspermatogenesis and tubular hypoplasia following 28 days of non-occluded, non-abraded dermal exposure to sexually immature rabbits. In the supplemental submission, Exxon Chemical Americas provided a complete copy of the final report of the 28-day rabbit dermal application study of the subject compounds. In addition, the submitter reported that sample code MRD-80-51 refers to the zinc salt of phosphorodithioic acid, (secondary butyl and isooctyl) mixed esters, and that sample code MRD-80-53 refers to the zinc salt of phosphorodithioic acid, O,O',-di(isohexyl, isoheptyl, isooctyl, isononyl, isodecyl) mixed esters.

In providing these in vivo findings under TSCA Section 8(e), the submitter referenced previous 8(e) notices (8EHQ-0680-0346 et seq. submitted by the Ethyl Corporation) in which similar results were reported for other related ZDDP compounds. Exxon stated that the combined submissions "suggest that a broad-based, perhaps generic effect, may have been uncovered." Exxon Chemical Americas also pointed out that the Agency had previously received Premanufacturing Notices (PMNs) on the zinc salt of phosphorodithioic acid, O,O'-di(isohexyl, isoheptyl, isooctyl, isononyl, isodecyl) mixed esters, and its chemical intermediate. Exxon reported that the PMN case numbers assigned by the EPA were P-80-146 and P-80-147.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

The serious effects found in the submitted study are that the tested compounds are skin irritants which are absorbed through the skin and produce adverse changes in the testes. These effects are most likely caused by the direct action of the chemicals on the testes rather than secondary to an "alarm reaction." The low intensity and frequency of effects on the adrenal cortex, pituitary, and thymic involution do not support the existence of a "stress" or "alarm" reaction.

If ZDDPs affect the interstitial substance of the testis and thereby decrease testosterone secretion, persons exposed to the compounds could be monitored for testosterone levels in the blood, gynecomastia (male breast enlargement), and sperm counts. It would also be of interest to know what is being absorbed through the skin and what is being excreted in the urine. If the ZDDPs are first hydrolyzed by bacteria on the skin, it may be possible to develop ZDDPs which are not affected by bacterial esterases.

Current Production and Use

In its initial submission, Exxon Chemical Americas reported that the tested ZDDP compounds were non-commercial. Although the submission did not contain any information on past or expected production volumes of the tested chemical substances, Exxon did report that compounds within the ZDDP class are widely used in lubricating oils and greases as anti-wear additives.

Comments/Recommendations

Exxon Chemical Americas reported that its employees, customers, co-producers, and transporters of ZDDPs are being advised of the submitted rabbit dermal application test findings. The submitting company also reported that, in the judgment of its medical professionals, no changes are warranted in the current industrial hygiene practices which already include recommendations to avoid skin contact with ZDDPs and thorough washing after the use of such compounds. In addition, Exxon reported that it is presently participating in a Chemical Manufacturers Association (CMA)-sponsored workgroup which has been established to assess the "potential reproductive hazards and risks, if any, posed by exposure to ZDDP in workplace settings." Exxon stated that it will cooperate within the workgroup to keep the EPA informed of the progress of the workplace assessment.

a) It is recommended that Chemical Hazard Information Profiles (CHIPs) be considered for preparation on selected ZDDP compounds.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, the Notice Review Branch (NRB/CCD/EPA), the Initial Screen and Profiles Team (ISPT/CHIB/AD/EPA) and to the Ethyl Corporation. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for appropriate distribution. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and/or importers of ZDDP compounds as listed in the Master TSCA Inventory, and to industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0181-0380
Page 1 of 3

DATE: FEB 10

SUBJECT: Status Report* 8EHQ-0181-0380

Approved JM 3/6/81

Revision
Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

R. T. Vanderbilt Company, Inc. has reported that the results of an acute study of 1,3,4-thiadiazolidine-2,5-dithione (CAS No. 1072-71-5) in rabbit eyes show the tested substance to be a severe eye irritant. The submitter states that the study was carried out according to a method described in the Federal Hazardous Substances Act (16 CFR 125) and the results interpreted according to the Draize scale for irritation (Draize et al.; J. Pharm. Exp. Ther.; Vol. 82; 1944). The submitter reports that although water washing reduces the degree of irritation, the chemical (0.1 g instilled in the rabbit eye) is a severe irritant in the unwashed eye. The submitter also reports, however, that the overall results indicate the irritation effect to be reversible.

Submission Evaluation

Thiazole derivatives are known irritants. Therefore, it is not surprising that the subject thiadiazolidine compound, which is a closely related substance, is also an irritant. It is important to point out that animal corneas recover more readily from opacity caused by irritation than do human corneas. With regard to the submitted study, which involved a 30 second chemical exposure to the eyes, it would be interesting to know what the outcome of a 60 second chemical exposure to the eye followed by a water wash would be.

Current Production and Use

A review of the production range (includes importation volumes) statistics for 1,3,4-thiadiazolidine-2,5-dithione (CAS No. 1072-71-5), which is listed in the initial TSCA Inventory, has shown that between 20 thousand and 202 thousand pounds of this chemical were produced/imported in 1977. This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710). The submitting company did not provide any information on the use(s) of the subject chemical substance, nor was such information located in the secondary literature sources consulted.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Comments/Recommendations

Based on an initial review and evaluation of the toxicity information contained in 8EHQ-0181-0380, the EPA believes that the provided acute rabbit eye irritation study results did not warrant submission to the Agency pursuant to Section 8(e) of the Toxic Substances Control Act (PL 94-469). The basis for the EPA's position is as follows:

> The preface to Part V of the Agency's March 16, 1978, "Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" (43 FR 11110) states that "a substantial risk of injury to health or the environment is a risk of considerable concern because of (a) the seriousness of the effect... and (b) the fact or probability of its occurrence." With regard to the seriousness of the effect, Part V explains further that the Agency considers the health effects for which substantial risk information must be reported to include "any pattern of effects or evidence which reasonably supports the conclusion that the chemical substance or mixture can produce cancer, mutation, birth defects, or toxic effects resulting in death, or serious or prolonged incapacitation." The information respecting these effects can be obtained directly or inferred from designed studies (e.g. in vivo experiments and tests as described in Part VI of the policy statement). With regard to the "fact or probability of its occurrence" criterion, Part V also provides that certain health effects are so serious that relatively little weight should be given to the chemical's exposure in determining whether a risk is substantial.
>
> The EPA's response to Comment 14 in Appendix B of the March 16, 1978 policy statement provides guidance with regard to the reportability of results obtained from routine acute in vivo range finding tests such LD50 determinations, irritation tests, etc. In its response, the EPA stated that it believes that "many routine tests are based on a knowledge of toxicity associated with a chemical..." The EPA's response also directs that unknown effects which occur and are observed and/or determined during acute in vivo range tests may have to be reported if those effects are serious and meet the reporting requirements set forth in Parts V and VI of the policy statement.

> Thus when evaluating the results of acute animal toxicity studies for submission under TSCA Section 8(e), the Agency believes that submitting companies should consider such factors as the lethal dose, the route of administration, the occurrence of unexpected effects (which could be obtained via "cage-side" observations, during necropsy, etc.), and the extent and pattern of the exposure of the subject chemical substance(s). In general, when evaluating such information for Section 8(e) reporting, the greater the acute toxicity, the less heavily companies should weigh the tested chemical's exposure, and vice versa.

Based on the preceeding discussion, it is the EPA's preliminary determination that the results from the acute rabbit eye irritation study, as provided by Vanderbilt in the present notice, did not warrant submission to the Agency pursuant to TSCA Section 8(e). However, in making this preliminary determination, it must be understood that the EPA may not be aware of additional pertinent information which may have been available to and/or considered by the company in reporting the toxicity data under Section 8(e). Therefore, the Chemical Hazard Identification Branch/AD will request the submitting company to provide its rationale as to why the provided results offer reasonable support for a conclusion of substantial risk of injury to health or the environment, as defined in the EPA's March 16, 1978, Section 8(e) policy statement ("Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk"; 43 FR 11110).

a) Considering the Agency's general interest in corporate actions which are taken (on a voluntary basis) in response to chemical toxicity/exposure information, the Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the R. T. Vanderbilt Company, Inc. to describe the actions it has taken, in light of the provided acute toxicity data, to warn workers and others, and to reduce and/or eliminate exposure to the subject chemical substance.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH and OSHA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for distribution to EPA Regional Offices and State agencies, and to labor, environmental, and selected citizen groups. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and/or importers of the subject chemical as listed in the Master TSCA Inventory.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: FEB - 9 1981

SUBJECT: Status Report* 8EHQ-0181-0381

Approved JM 3/25/81

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

PPG Industries, Inc. has provided summarized preliminary results from an acute rabbit dermal application study of a by-product stream composed mainly (98%) of a mixture of allyl alchol (CAS No. 107-18-6) and diallyl carbonate (major constituent; CAS No. 15022-08-9). According to the submitter, the results indicate that a single application of the by-product stream (0.2 g/kg to shaved, intact skin) resulted in 100% mortality of the test animals. In addition, the submitter reports that within 3 hours of the sample application, the animals exhibited cyanosis, nasal discharge, depressed respiration, and anesthesia. Necrospy findings reportedly included lung and gastrointestinal hemorrhages.

In its submission, PPG Industries reported that the dermal LD50 of allyl alcohol is 0.05 g/kg in rabbits and that dermal toxicity information on the diallyl carbonate could not be located in available literature. The submitter also pointed out that the acute dermal toxicity of the tested by-product stream "cannot be explained satisfactorily by the quantity [unspecified] of allyl alcohol present; therefore, it is reasonable to suspect that diallyl carbonate may be the primary toxic component of this mixture."

With regard to the nature and extent of risk involved with exposure to the by-product stream (which is reportedly generated, collected, and periodically incinerated at a PPG plant site in Barberton, Ohio), the submitter stated that "an initial review of the plant hospital daily log failed to reveal any reported cases of skin or systemic effects associated with this by-product stream. However, the animal test information would suggest this by-product stream may represent a potentially high degree of risk upon dermal contact." In addition, the submitter "believes that the absence of previously reported employee illnesses associated with this by-product, together with the containment and personal protection practices employed within the workplace serve to minimize the risk of harm to health or the environment."

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

Although it is clear why the submitter suspects that the primary toxic component may have been diallyl carbonate, some doubt remains because the submission did not indicate the percentages of diallyl carbonate and other components in the mixture.

Allyl alcohol, acrolein, and allyl esters are known to be severe irritants to many tissues including those of the respiratory tract. Some allyl compounds produce liver injury. The signs of toxicity mentioned in the submission are compatable with the general toxicity of allyl compounds.

It is not clear whether the observed depressed respiration was a result of direct irritation of the lungs or secondary to depression of the respiratory center in the medulla of the brain. It is also not clear what signs of anesthesia were observed in the study. Many esters and ketones are capable of producing anesthesia. Diallyl carbonate, which boils at 100°C and is structurally analogous to anesthetic ketones, could have remained on the skin to be absorbed in significant quantities before evaporation occurred. The latent period to death of the test animals could have had several causes including slow transformation of the diallyl carbonate to either allyl alcohol or acrolein.

Current Production and Use

PPG Industries, Inc. did not provide any information concerning the actual amounts of the chemical components which are in the tested by-product stream, nor did the company provide any information on the industrial process(es) from which the subject by-product stream is generated, or information on the amounts of the by-product stream generated. No information on the production volumes or use (if any) of the by-product stream was located in the secondary literature sources consulted.

A review of the production range (includes importation volumes) statistics for allyl alcohol (CAS No. 107-18-6), which is listed in the initial TSCA Inventory, has shown that between 21 million and 110 million pounds of this chemical were produced/imported in 1977. **/

Allyl alcohol is used in the manufacture of resins, plasticizers, glycerol, acrolein, pharmaceuticals, herbicides, poison gases, and other organic compounds.

A review of the production range (includes importation volumes) statistics for diallyl carbonate (CAS No. 15022-08-9), which is listed in the initial TSCA Inventory, has shown that between 100 thousand and 1 million pounds of this chemical were produced/imported in 1977 **/

No information on the use(s) of diallyl carbonate was located in the secondary literature sources consulted.

Comments/Recommendations

PPG Industries reported that all employees having potential contact with the subject by-product stream have been informed of the submitted acute rabbit dermal toxicity test results. In addition, the submitter reports that existing work practices have been reviewed and found to be generally satisfactory. PPG stated that because "work practices were already based upon the handling of allyl alcohol, a substance with similar hazardous qualities, modifications to current work practices have been instituted where necessary to reflect this new [submitted] information." In addition, the submitting company reported that it is in the process of conducting acute dermal LD50 tests on purified diallyl carbonate and a typical by-product stream sample. PPG stated that the results of the ongoing tests will be provided to the EPA.

On August 29, 1979 (44 FR 50766), the EPA Office of Water and Waste Management (OWWM) designated allyl alcohol as a hazardous substance; spills or releases of specified amounts are reportable under Section 311 of the Clean Water Act (CWA). Under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA; Section 3), the EPA Office of Pesticide Programs (OPP/OPTS) has regulated certain FIFRA-related uses of allyl alcohol.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the submitting company to provide a complete copy of the results, including test protocol(s) and data obtained from the acute rabbit dermal study which prompted the submission of this Section 8(e) notice. In addition, the company will be requested to provide a description of the process(es) from which the tested by-product stream is generated, information on the amount of by-product generated, and information on the actual amounts and chemical identities of all of the constituents in the by-product stream.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

b) It is recommended that allyl alcohol and diallyl carbonate be considered for inclusion in TSCA Section 8(a) Level A reporting.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, OPP/EPA, and OWWM/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for distribution to EPA Regional Offices and State agencies, and to labor, environmental, and selected citizen groups. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and/or importers of allyl alcohol and diallyl carbonate as listed in the Master TSCA Inventory, and to industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0281-0382
Page 1 of 3

DATE: FEB 23 1981

SUBJECT: Status Report* 8EHQ-0281-0382

Approved JM 3/2/81

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

Glyco Chemicals, Inc. has submitted summarized findngs from several acute *in vivo* studies on three related halogenated dimethylhydantoin derivatives: bromochlorodimethylhydantoin (BCDMH; CAS No. 126-06-7); dichlorodimethylhydantoin (DCDMH; CAS No. 118-52-5); and dibromodimethylhydantoin (DBDMH; CAS No. 77-48-5). The submitter reported that BCDMH was found to be toxic to mice and rats at oral doses of 690 and 600 mg/kg respectively. BCDMH was also reported to be a moderately severe irritant and corrosive to the skin (species not identified), and a severe irritant to the eyes (species not identified), capable of causing irreversible cellular damage to eye tissue. The submitter reported that at higher oral doses (amounts not specified), systemic effects (type of effects and species not identified) were noted in the lungs and other organs. With regard to skin absorption, Glyco reported that systemic effects observed following dermal application of BCDMH were concluded to have been due to entry of the compound to the general circulation through corroded skin. Glyco also reported that earlier toxicological studies performed with DCDMH and DBDMH had shown that these two compounds produced similar effects. In addition, the submitter reported that skin sensitization and inhalation toxicity studies on BCDMH were now in progress.

In submitting these summarized results under TSCA Section 8(e), Glyco stated that the provided toxicological findings "provide a general assessment of the potential hazards of these materials under the most unfavorable exposure circumstances." The submitting company also stated that it does "not believe that the data support the conclusion that BCDMH presents a substantial risk to human health and the environment." Glyco reported that its conclusion is supported by over 25 years of continuous experience in the manufacturing and marketing of the DCDMH product, the results of a 1975 NIOSH Health Hazard Evaluation Determination (Report No. 73-160-206), and the results of a 1979 Glyco-sponsored cross-sectional morbidity study. The submitting company stated that, in combination, the above findings "all confirm a total absence of occupationally related diseases in the workplace where DCDMH and DBDMH are and were manufactured."

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

It is not surprising that DCDMH, BCDMH, and DBDMH are irritating. Although the submitter's supposition that the compounds are not absorbable through intact skin may be valid, pharmicokinetic data would be needed to confirm this theory.

The subject compounds are at the same time both haloamides and dialkyl hydantoins. Halogenated amides have both oxidizing and halogenating properties. The chlorinated amides are sufficiently stable in water to be used as antiseptics (e.g. Halozone is used to sterilize drinking water and Chloramine T is used as a topical antiseptic for dressing wounds). Chlorinated amides can be highly irritating to skin and mucous membranes and only those with minimal irritating properties have survived for medical purposes.

5,5-Diphenyl hydantoin appears to have been established as a teratogen in humans and has been reported to produce lymphatic disease similar to Hodgkin's Disease (a lymphoid tumor), and a number of other toxicities. 5-Phenyl,5-ethyl hydantoins have produced severe toxicities in humans and are no longer recommended as drugs. 5,5-diethyl hydantoins can produce sleep in animals.

Current Production and Use

A review of the production range (includes importation volumes) statistics for BCDMH (CAS No. 126-06-7) and DCDMH (CAS No. 118-52-5), which are listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a)). **/

A review of the production range (includes importation volumes) statistics for DBDMH (CAS No. 77-48-5), which is listed in the initial TSCA Inventory, has shown that between 20 thousand and 200 thousand pounds of this chemical were produced/imported in 1977. This production range information does not include any

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**/ The data submitted for the TSCA Inventory including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. **/

Glyco reported that BCDMH, which is currently in the R&D stage at Glyco, is registered and sold as a pesticide by at least one other U.S. company. Glyco also reported that it is attempting to develop applications for BCDMH in the markets served by its DCDMH product which has been produced and sold by Glyco for over 25 years. Other than the pesticide use of BCDMH, the submitter did not provide any information on the proposed or actual use(s) of the subject chemicals, nor was such information located in the secondary literature sources consulted.

Comments/Recommendations

BCDMH (CAS No. 126-06-7) and DCDMH (CAS No. 118-52-5) are listed in the EPA's February 29, 1980 proposed TSCA Section 8(a) Level A rule (45 FR 13646).

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the submitting company to provide complete copies of the final results, including protocols and data, from all of the studies cited in its submission, with the exception of the NIOSH Health Hazard Evaluation Determination report. Considering the Agency's general interest in corporate actions taken on a voluntary basis in response to chemical toxicity/ exposure information, CHIB will also request Glyco Chemicals, Inc. to describe the actions it has taken, in light of the provided toxicity information, to warn workers and others, and to reduce and/or eliminate exposure to the subject chemical substances.

b) The Chemical Hazard Identification Branch will transmit a copy this status report to NIOSH, OSHA, and OPP/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for distribution to EPA Regional Offices and State agencies, and to labor, environmental, and selected citizen groups. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and/or importers of the subject chemicals as listed in the Master TSCA Inventory, and to industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0281-0383
Page 1 of 3

Approved 2/27/81

Revision
Needed

DATE: FEB 23 1981

SUBJECT: Status Report* 8EHQ-0281-0383

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

Note: The submitting company has claimed its name to be Confidential Business Information (CBI).

The submitter has reported that 7-chloro-4-nitrobenzo-2-oxa-1,3-diazole (NBD Chloride; CAS No. 10199-89-0) was shown to be mutagenic in an in vitro Salmonella (bacteria) test. In providing this information under TSCA Section 8(e), the submitter stated that the results of the study from which this reported information was derived had appeared in Chem. Biol. Interactions (Vol. 19) in 1977. The company provided a copy of that article and one other (Mutation Research; Vol. 48; 1977) which reportedly indicates that analogs of NBD Chloride are also mutagenic. In addition, the submitter stated that the provided "articles have probably been abstracted in widely available compilations, such as Chem. Abstracts..."

Submission Evaluation

Given the known mutagenicity of chemicals which are structurally related to NBD Chloride, one would also expect NBD Chloride to have some degree of mutagenic activity. However, this cannot be concluded from the data which were submitted. The only conclusions that can be drawn from the submitted data are that 10 mg/ml NBD Chloride produced a bigger transformed colony than did 1 mg/ml NBD Chloride, and the addition of enzyme activation appears to have increased the size of the transformed colony produced at the 1 mg/ml dose level. It should be pointed out that information on transformed colony size, rather than actual transformed colony count data, is of little value when attempting to interpret mutagenicity data. This is especially true when control data are lacking, as they were in the submitted articles.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

A review of the production range (include importation volumes) statistics for NBD Chloride (CAS No. 10199-89-0), which is listed in the initial TSCA Inventory, has shown that between 0 and 1000 pounds of this chemical were produced/imported in 1977. **/

The submitter reported that the amount of NBD Chloride introduced into commerce is probably less than one kilogram annually. The submitting company also reported that NBD Chloride is used principally as a highly fluorescent tag for proteins in biochemical research. No other use information was located in the secondary literature sources consulted.

Comments/Recommendations

Based on an initial review and evaluation of the information contained in 8EHQ-0281-0383, the EPA believes that the provided *in vitro* mutagenicity/exposure information did not warrant submission to the Agency pursuant to Section 8(e) of the Toxic Substances Control Act (PL 94-469). The basis for the EPA's position is as follows:

> The preface to Part V of the Agency's March 16, 1978, "Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" (43 FR 11110) states that "a substantial risk of injury to health or the environment is a risk of considerable concern because of (a) the seriousness of the effect... and (b) the fact or probability of its occurrence." With regard to the "fact or probability of its occurrence" criterion, Part V states that certain health effects are so serious that relatively little weight should be given to the chemical's exposure in determining whether a risk is substantial. With regard to the seriousness of the effect, Part V explains further that the Agency considers the health effects for which substantial risk information must be reported to include "any pattern of effects or evidence which reasonably supports the conclusion that the chemical substance or mixture can produce cancer, mutation, birth defects, or toxic effects resulting in death, or serious or prolonged incapacitation." The information respecting these effects can be obtained directly or inferred from designed studies (e.g. *in vivo* and *in vitro* experiments and tests as described in Part VI of

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**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

> the policy statement). However, with regard to the circumstances under which the results of acute in vitro tests should be reported, Part VI clarifies that the reporting of positive results from such tests (e.g. Ames tests) will depend upon the existence of corroborative information if necessary to support the conclusion of substantial risk. In addition, Part VII of the policy statement states that information need not be reported if the information has been published in the scientific literature and referenced by certain abstract services including Chemical Abstracts.

On the basis of the preceeding discussion, it is the Agency's preliminary determination that the in vitro mutagenicity and chemical exposure information contained in 8EHQ-0281-0383 does not provide reasonable support for a conclusion that NBD Chloride poses a substantial risk of injury to health or the environment and therefore did not warrant submission to the EPA under Section 8(e) of the Toxic Substances Control Act.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0281-0384
Page 1 of 3

DATE: FEB 23

SUBJECT: Status Report* 8EHQ-0281-0384

Approved 3/10/81

Revision
Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Dow Chemical Company has submitted summarized final and/or preliminary results from several recently completed and ongoing *in vivo* toxicity studies of ethylene glycol monomethyl ether (EGME; 2-methoxyethanol; CAS No. 109-86-4). Dow reported that two 9-day inhalation studies involving rats, mice, and rabbits exposed to EGME at concentrations of 0, 100, 300, or 1000 ppm, have been recently completed (unpublished Dow results; 1980). According to the submitter, the highest level (1000 ppm) of EGME was lethal to the rabbits, and caused hematological, testicular, and lymphoid effects in rabbits, mice, and rats. Histopathologic changes in the animals exposed to 1000 ppm reportedly included "decreased bone marrow cellularity, degeneration of the testicular germinal epithelium, and partial depletion of lymphoid elements in the thymus, spleen and lymph nodes." Although similar but less pronounced changes were reportedly observed in the animals exposed to 300 ppm EGME, Dow stated that no adverse effects attributable to exposure to EGME were noted in the animals at the 100 ppm dose level.

Dow reported that upon completion of the 9-day inhalation studies, subchronic toxicity studies in rats and rabbits, and reproduction and dominant lethal mutagenicity studies in rats were initiated and are currently in progress. The submitter reported that the animals in these studies have been exposed to EGME at concentrations of 0, 30, 100, or 300 ppm for 6 hours/day, 5 days/week for 13 weeks. Although final results are not yet available from these studies, Dow reported that the preliminary findings can be summarized as follows: "...exposure of rats and rabbits to EGME at 300 ppm for 13 weeks resulted in hematologic abnormalities, decreased testicular and thymus weights, histopathologic changes in testes, and sterility in male rats. At 100 ppm, histopathologic changes of the testes were found in 3 of 5 male rabbits. Slight testicular changes were detected histopathologically in 1 of 5 male rabbits exposed to 30 ppm."

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In its submission, Dow also provided a synopsis of several published scientific articles on EGME toxicity in laboratory animals and humans. Dow also reported that, according to the published literature, aberrations have been observed in the peripheral blood of humans exposed to EGME in excess of 25-75 ppm. Dow stated that those observed blood changes in humans exposed to EGME appear to correlate well with the animal data. However, Dow also reported that in its current 13-week studies, "testicular changes persisted at lower concentrations than hematological changes in rabbits but not rats." In considering these findings, Dow reported that although the company is not aware of "any adverse testicular or reproductive effects in humans, the possibility exists that the testes of man may be affected by exposure to lower levels of EGME than needed to cause adverse hematological effects." Dow also reported that because systemic effects arising from human skin contact with EGME has been reported in the published literature, "skin absorption can be an additional potential route of significant exposure." In addition, Dow reported that the "observed testicular changes in rabbits at 100 and 30 ppm by the inhalation route suggests that the current TLV (25 ppm) may not provide an adequate margin of safety for workers exposed to EGME."

Submission Evaluation

The information contained in this submission suggests that the test animals exposed to 300 and 1000 ppm EGME sustained an "alarm reaction." This is indicated by the observed involution of the lymphoid tissue, especially the thymus. However, microscopic examination of the adrenal cortex would be needed to confirm this suspicion. Frequently, an alarm reaction can result in adverse effects on the testes due to cessation of gonadotrophic hormone secretion by the anterior pituitary. The significance of the reported findings may become more clear following the EPA's receipt and evaluation of the actual data obtained from the preliminary and subchronic Dow studies, including the results of microscopic examinations (if performed) of the lymphoid organs, adrenal cortex, and bone marrow.

Current Production and Use

A review of the production range (includes importation volumes) statistics for ethylene glycol monomethyl ether (CAS No. 109-86-4), which is listed in the initial TSCA Inventory, has shown that between 31 million and 162 million pounds of this chemical were produced/imported in 1977. **/

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

According to secondary literature sources, ethylene glycol monomethyl ether is used as a solvent for nitrocellulose, cellulose acetate, alcohol soluble dyes, and natural and synthetic resins. The chemical is also used in solvent mixtures, lacquers, enamels, varnishes, leathers, perfume fixatives, wood stains, jet fuels (de-icing additive), and in sealing moisture-proof cellophane.

Comments/Recommendations

The Dow Chemical Company reported that, in accordance with its long-standing company policy, the provided toxicity information on ethylene glycol monomethyl ether is being transmitted to Dow employees, customers, and to other producers. Dow also reported that the final reports from its ongoing studies will be provided to the EPA.

Ethylene glycol monomethyl ether (CAS No. 109-86-4) is listed in the EPA's February 29, 1980 proposed TSCA Section 8(a) level A rule (45 FR 13646).

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Dow Chemical Company to provide complete copies of the results, including test protocols and data, from the unpublished Dow 9-day studies cited in its submission. Dow will also be requested to provide complete copies of the results from microscopic examinations (if performed) on the lymphoid organs, adrenal cortex, and bone marrow from the animals in the preliminary 9-day studies and the subchronic studies of EGME.

b) The Chemical Hazard Identification Branch will review the requested information, revise this status report as appropriate, and recommend further followup assessment if warranted.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, and OWWM/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for distribution to EPA Regional Offices and State agencies, and to labor, environmental, and selected citizen groups. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and/or importers of EGME as listed in the Master TSCA Inventory, and to industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0281-0385
Page 1 of 2

DATE: MAR - 4 1981

SUBJECT: Status Report* 8EHQ-0281-0385

Approved JM 3/4/81

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Gulf Oil Company - U.S. has submitted a summary of the final results from two sets of short-term *in vitro* mammalian mutagenicity and cell transformation assays of the following Gulf products: Superquench 70, Process 65 (Gulf N.E. 61), Process 63 (Gulf N.E. 75), and 100 Texas Oil. According to the submitter, the Superquench 70 and Process 63 products were found to be positive for mutagenicity in the presence of exogenous metabolic activation and negative without activation in the Mouse Forward Mutation Assay. Process 65 was also reported to be positive in the presence of metabolic activation. However, the results obtained with Process 65 were reported to be inconclusive in the absence of activation. The submitter reported that inconclusive results were also obtained with 100 Texas Oil both in the presence and absence of exogenous metabolic activation. With regard to the results of the performed C3H/10T ½ Mouse Cell Transformation Assays, the submitting company did not provide its judgement as to whether the results obtained with the tested products were considered negative, positive or equivocal.

Submission Evaluation

As presented, the summarized results of the *in vitro* Mouse Lymphoma Forward Mutation Assays do indicate that the Superquench 70, Process 65, and Process 63 products have some degree of mutagenic activity in cultured mammalian cells. In addition, the provided summarized results from the performed *in vitro* C3H/10T ½ Mouse Cell Transformation Assays, indicate that several of the tested products may have some degree of cultured mammalian cell transforming activity. However, without complete copies of the test protocols and data, a more complete evaluation of the reported *in vitro* findings is not possible at this time.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

Gulf Oil Company - U.S. reported that Superquench 70, Process 65 (Gulf N.E. 61), Process 63 (Gulf N.E. 75), and 100 Texas Oil are listed under the Gulf Refining and Marketing Company in the Initial TSCA Inventory-Reporting Company Section. Gulf Oil Company - U.S. did not provide any information concerning the identity of the chemical component(s) in the tested products, or any information on the use(s) of those products. No information on the production volumes or uses of the subject Gulf products was located in the secondary literature sources consulted.

Comments/Recommendations

Gulf reported that it is evaluating the significance of the provided *in vitro* assay results and plans to conduct further testing of the products. The submitter also reported that the results of these additional tests would be provided to the EPA.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the submitter to provide complete copies of the results, including test protocols and data, from the *in vitro* studies cited in the submission. In addition, the submitter will be requested to provide the actual chemical identity (including CAS Numbers) and amount(s) of the components in each of the tested Gulf products.

b) Considering the Agency's general interest in corporate actions which are taken (on a voluntary basis) in response to chemical toxicity/exposure information, the Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Gulf Oil Company - U.S. to describe the actions it has taken, in light of the provided toxicity data, to warn workers and others, and to reduce and/or eliminate exposure to the subject chemical substances.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH and OSHA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/ EPA) for distribution to EPA Regional Offices and State agencies, and to labor, environmental, and selected citizen groups.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0381-0386
Page 1 of 4

DATE: APR 21 1981

SUBJECT: Status Report* 8EHQ-0381-0386

Approved 4/22/81

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Shell Oil Company has submitted a copy of a NIOSH prepublication report (manuscript) containing the results from the testing of 19 selected workplace chemicals for teratogenic potential. The submitter stated that this information was being submitted pursuant to TSCA Section 8(e) because of 1) the experimental evidence of teratogenicity observed for 2-ethoxyethanol (CAS No. 110-80-5) in rats and rabbits (via inhalation), 2) the widespread use of that chemical, and 3) the fact that the established OSHA standard of 200 ppm for 2-ethoxyethanol is above the lowest level of exposure which was found to cause teratogenic effects in the NIOSH-sponsored experiments. Shell also provided a copy of its Material Safety Data Sheet and Safety Notice for OXITOL® (2-ethoxyethanol).

In summary, the Shell Oil Company reported that "at a 2-ethoxyethanol inhalation level of 160 ppm [for rabbits and 200 ppm for rats] for 7 hours/day on days 1-19 in rats, and 1-18 in rabbits, teratogenic effects were observed. These effects were characterized by skeletal and/or soft tissue abnormalities. Fetal toxicity was significant in both species. At higher exposure levels (615 ppm for rabbits and 765 for rats), severe embryotoxicity was in evidence." Shell also reported that none of the detailed information from the NIOSH study was available to the company.

The submitted NIOSH report contained the following summary of the experimental findings:

> "The reproductive toxicity and teratogenic potential of 19 industrial chemicals have been investigated during the past 3 years. Preliminary studies in rats, utilizing intraperitoneal treatments on days 1-15 of gestation, have been conducted on 10 chemicals: allyl chloride, bisphenol A,

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

> copper naphthenate, ethylene dibromide, hexachlorobutadiene, 2-mercaptobenzothiazole, methyl styrene, naphthalene, 2-nitropropane, and 1,2,3-trichloropropane. Studies in rats and rabbits, utilizing inhalation exposure on days 1-19 and 1-24, respectively, of gestation, have been conducted on 9 chemicals: butylene oxide, carbon disulfide, 2-ethoxyethanol, ethyl benzene, methyl bromide, nitrous oxide, styrene oxide, tetrachloroethylene, and trichloroethylene. In the preliminary studies, evidence of teratogenic potential was seen with allyl chloride and bisphenol A, and fetal toxicity was seen in the absence of maternal toxicity with methyl styrene and 2-nitropropane. In the inhalation studies, 2-ethoxyethanol was strongly embryotoxic at the higher exposure levels employed, and was teratogenic at the lower concentration."

Although the above NIOSH summary indicates that rabbits were exposed to the chemicals via inhalation during days 1-24 of gestation, the actual experimental protocol states(as does the submitter) that the rabbits' inhalation exposure to 2-ethoxyethanol lasted only to the 18th day of gestation.

Submission Evaluation

The reported NIOSH study demonstrates that inhalation of 2-ethoxyethanol vapors causes teratogenic effects at concentrations which are not toxic (rats) or only slightly toxic (rabbits) to dams. This particular finding raises questions about the possible teratogenic actions of 2-methoxy-, 2-propoxy-, and 2-butoxyethanols. It should also be noted that 2-ethoxyethanol can be absorbed through the skin and from the gastrointestinal tract.

Current Production and Use

A review of the production range (includes importation volumes) statistics for 2-ethoxyethanol (CAS No. 110-80-5), which is listed in the initial TSCA Inventory, has shown that between 62 million and 171 million pounds of this chemical were reported as produced/imported in 1977. **/

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Shell reported that on a yearly industry-wide basis (based on 1977 data), between 75 and 80 million pounds of 2-ethoxyethanol are used as a solvent for protective coatings. In addition, Shell reported that many of the end uses of the chemical are in proprietary coating formulations, largely in connection with resin, marine, and industrial coatings, and in oil-based lacquers. With regard to exposure, the company reported that the cited uses are generally limited to industrial settings because 2-ethoxyethanol is too volatile to be used in household paints. Shell also stated that it does not formulate protective coatings or inks and has no knowledge of specific end use exposure data.

According to secondary literature sources, 2-ethoxyethanol is used as a solvent for nitrocellulose and natural and synthetic resins. The chemical is also used in the formulation of soluble oils, lacquers and lacquer thinners, varnish removers, and cleaning solutions. 2-Ethoxyethanol is also used in dyeing and printing textiles, in leather processing, and as an anti-icing additive for aviation fuels.

Comments/Recommendations

The Shell Oil Company reported that although the company does not have specific measurements of the presence of 2-ethoxyethanol in the workplace, the company does recommend use of ventilation when working with the chemical. Shell also reported that its 2-ethoxyethanol production process is in a closed system which is located in an outdoor setting. The company stated that monitoring studies at Shell locations where the chemical is made and used are being initiated on a "priority basis." In addition, Shell reported that the information contained in its TSCA Section 8(e) submission is being provided to OSHA, NIOSH, Shell's employees and customers, and to other producers of 2-ethoxyethanol.

The National Cancer Institute/National Toxicology Program (NCI/NTP) is currently testing 2-ethoxyethanol for carcinogenicity via gavage in rats and mice. In addition, 2-ethoxyethanol is listed in the EPA's February 29, 1980 proposed TSCA Section 8(a) Level A rule (45 FR 13646).

a) The Chemical Hazard Identification Branch (CHIB/AD) will request the Shell Oil Company to provide the results of the company's planned 2-ethoxyethanol monitoring studies.

b) The Chemical Hazard Identification Branch will consider the preparation of a Chemical Hazard Information Profile (CHIP) on 2-ethoxyethanol. In addition, the reported NIOSH study will be screened in CHIB's Current Awareness Program for additional chemical candidates for further assessment.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, OWWM/EPA, OANR/EPA, CREB/AD/EPA, TRDB/AD/EPA and to the "Solvents Workgroup" of the EPA's Toxic Substances Priorities Committee (TSPC). CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for appropriate distribution. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and/or importers of the subject chemicals as listed in the Master TSCA Inventory, and to industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0381-0387
Page 1 of 3

DATE: MAR 26 19

SUBJECT: Status Report* 8EHQ-0381-0387

Approved 3/31/81

Revision
Needed ______

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Ethyl Corporation has reported that the results from a completed battery of mutagenicity tests of the 0,0-dimethyl ester of phosphorochloridothioic acid (DMCTP; CAS No. 2524-03-0) were negative, with the exception of a dominant lethal test in rats. The company submitted the results and discussion section from the final report of the in vivo dominant lethal assay. Ethyl reported that male rats were dosed (via gavage) with DMCTP for five days and then bred with 2 virgin females per week for seven weeks. The highest dose given (75 mg/kg/day) was reported to be 10% of the LD50. According to the submitter, the chemical was found to increase the number of dead implants per pregnant female rat in week five at doses of 25 and 75 mg/kg/day and in week six at doses of 7.5 and 75 mg/kg/day. In addition, Ethyl reported that significant preimplantation losses were found (week five) at DMCTP doses of 7.5 and 75 mg/kg/day.

Ethyl stated that the obtained data has led the company to conclude that DMCTP produced a statistically significant level of dominant lethality. The submitter pointed out, however, that the fertility index (percent of fertile matings) was unaffected by DMCTP treatment. This latter finding was reportedly consistent with the results of a 90-day inhalation study of DMCTP which, based on preliminary examinations, did not show any effect on gonadal weights or histopathological appearance of the gonadal tissues. The company did not provide any information on the species or the DMCTP dose(s) tested in the cited 90-day inhalation study, nor did the company provide any specific information on the other performed mutagencity tests which were reportedly negative.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

Although dominant lethality is not a "heritable" event, it does signify a serious adverse effect on the mammalian germ line resulting in embryo lethality.

According to the information provided, the tested compound does appear to have caused a significant level of dominant lethality. However, without complete copies of the data, a more complete evaluation of the reported test results is not possible at this time.

Current Production and Use

A review of the production range (includes importation volumes) statistics for phosphorochloridothioic acid, 0,0-dimethyl ester (CAS No. 2524-03-0), which is listed in the initial TSCA Inventory, has shown that between 11 million and 60 million pounds of this chemical were produced/imported in 1977.**/

The Ethyl Corporation reported that it does not produce DMCTP and that the company is not in a position to judge exposure potential. Ethyl stated that it believes that the only use of DMCTP is as an intermediate in pesticides manufacture. No other information on the use(s) of DMCTP was located in the secondary literature sources consulted.

Comments/Recommendations

The Ethyl Corporation reported that it does not plan to produce DMCTP commercially, and does not have any plans to conduct further toxicity studies of the chemical.

The 0,0-dimethyl ester of phosphorochloridothioic acid (DMCTP; CAS No. 2524-03-0) is listed in the EPA's February 29, 1980 proposed TSCA Section 8(a) Level A rule (45 FR 13646).

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Ethyl Corporation to provide complete copies of the final results (including data and protocols) from all of the laboratory studies cited in its submission.

b) The Chemical Hazard Identification Branch will consider including a discussion of the submitted DMCTP toxicity

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**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

data in the Chemical Hazard Information Profile (CHIP) which is being prepared on the O,O-diethyl ester of phosphorochloridothioic acid (DECTP; CAS No. 2524-04-1).

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, and OPP/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for appropriate distribution. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and/or importers of the subject chemical as listed in the Master TSCA Inventory, and to industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: APR 21 1981

SUBJECT: Status Report* 8EHQ-0381-0388 S

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Approved 4/22/81

Revision
Needed

Submission Description

Exxon Chemical Americas has submitted preliminary results from a 28-day rabbit dermal application study of Paranox 52 which reportedly contains the calcium salt of an alkylated phenol sulfide. (The exact chemical identity and CAS Number of the calcium compound has been claimed as Confidential Business Information (CBI) by the company). The submitter pointed out that the tested product is commonly referred to as a "calcium phenate" in the lubricant additive industry. According to Exxon, Paranox 52 at concentrations of 25% and 100% (medicinal white oil vehicle) caused a decrease in testicular weights, aspermatogenesis, and tubular hypoplasia in sexually immature male rabbits. The company stated that following a 30-day post-exposure period, the testicular toxicity was found to be reversible in the low dose (25%) groups, but not in the groups which had received 100% Paranox 52. The submitter noted, however, that "the 30-day recovery period did not encompass a complete spermatogenic cycle (approximately 43 days) during which regeneration could take place."

Exxon Chemical Americas reported that all available data from the rabbit dermal application study of Paranox 52 have been provided and that the final pathology results (expected by June, 1981) will be submitted to the EPA should the results differ significantly from those reported in the present submission. In addition, the submitter stated that the experimental results obtained thus far from the study of Paranox 52 are similar to those reported previously under TSCA Section 8(e) for the ZDDP (zinc dialkyldithiophosphate) class of compounds (8EHQ-0680-0346 et seq., Ethyl Corporation; and 8EHQ-0181-0379 et seq., Exxon Chemical Americas).

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

It is important to note that the calcium salt compound should not be confused with calcium phenate which is itself a unique chemical substance. With regard to the observed toxicological effects, the Paranox 52 product, as well as several of the compounds within the referenced ZDDP class, have now been observed to cause testicular degeneration and aspermatogenesis in laboratory animals. It remains to be established whether the observed toxic effects are produced through the pituitary, thyroid, and/or adrenals, or by a direct effect on the tubules or, more likely, on the testicular interstitial tissue (Leydig cells) which governs testosterone synthesis and release.

Current Production and Use

Due to the fact that Exxon Chemical Americas has claimed the actual chemical identity and CAS Number of the "calcium salt of an alkylated phenol sulfide" as TSCA CBI, a review of the production range statistics from the non-confidential TSCA Inventory will not appear in this status report.

According to the submitter, Paranox 52 is used as a detergent inhibitor in engine lubricating oils. No other information on the production and use(s) of the product was located in the secondary literature sources consulted.

Comments/Recommendations

Exxon Chemical Americas reported that the company is advising its employees, customers, co-producers, and transporters of the submitted results. It is the submitter's medical judgment that "no change in current industrial hygiene practices is warranted. Present recommendations include avoidance of skin contact and thorough washing after use." Exxon Chemical Americas also reported that it will carefully monitor the efforts of the Chemical Manufacturers Association (CMA)-sponsored ZDDP workgroup. The submitter reportedly plans to use the results of the initial ZDDP studies as well as the final pathology results of the present dermal application study of Paranox 52 to assess the potential hazards, if any, posed by exposure to the product in workplace settings. Exxon stated that the EPA will be informed of the company's progress to that end.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request Exxon Chemical Americas to provide a complete copy of the final report, including test protocols and data, from the 28-day rabbit dermal application study of Paranox 52. In addition, the submitter will be requested to provide the identity (i.e. actual chemical name and CAS Number) and amount of each chemical component of Paranox 52.

b) The Chemical Hazard Identification Branch will consider the preparation of a Chemical Hazard Information Profile (CHIP) on the chemical referred to in this submission as a calcuim salt of an alkylated phenol sulfide. In addition, it is recommended that the chemical be considered for inclusion in future TSCA Section 8(a) Level A reporting.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, and OWWM/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for appropriate distribution. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0381-0389
Page 1 of 3

DATE: APR - 3 1981

SUBJECT: Status Report *8EHQ-0381-0389

Approved JM 4/17/81

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

Revision
Needed ______

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Shell Oil Company has submitted an interim report from a 2-year mouse skin-painting study of composite samples of new and used motor oil. According to the submitter, by the 72nd week of this American Petroleum Institute-sponsored study, 3 of 50 mice treated with used motor oil have malignant tumors and 6 have benign tumors. Of the 6 mice with benign tumors, Shell stated that 2 have been confirmed histologically and 4 animals are still alive. Shell also reported that after 35 weeks, no tumors have been found in the 50 mice exposed dermally to new motor oil.

Shell stated that because polynuclear aromatic hydrocarbon (PNA) enrichment is known to occur in motor oils during normal engine use, the test results are not unexpected. Shell provided the results of an analysis for selected PNAs which shows a significant increase in PNA concentration in the used versus new composite oil samples.

The Shell Oil Company noted that the following points highlight its areas of concern:

"1) The mice being exposed to used motor oil show biologically significant effects. Statistical analysis of the data confirms that the effects seen in the used motor oil group are significantly different from the control groups.

2) Analyses show that the used motor oil composite has undergone PNA enrichment compared to the new motor oil composite.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

3) The potential exists for widespread exposure to used motor oil, such as with service station and maintenance garage personnel, automobile manufacturers and dealers, and used oil reclaimers/dealers. Some persons in an exposure situation may not use proper personal hygiene and safe handling procedures as recommended."

In submitting this information under TSCA Section 8(e), Shell stated that the "information forms a pattern which reasonably supports the conclusion that used motor oil may present a substantial risk to persons not observing the necessary precautions."

Submission Evaluation

Based on the submitted information, the used motor oil sample has demonstrated oncogenic and carcinogenic effects in the mice to which it was dermally applied. The cause appears to be polynuclear aromatic hydrocarbon enrichment brought about during engine use. The submission does not indicate either the type or location of the benign and malignant tumors in the test animals.

Current Production and Use

Based on the nature of this submission, a review of current production and use of motor oils does not appear to be warranted at this time.

Comments/Recommendations

The Shell Oil Company stated that "petroleum based lubricants (including used motor oil) present negligible health hazards to the user when proper handling and personal hygiene procedures are followed, even in light of this new information. To assist Shell employees and customers alike in this regard, [Shell has] prepared a safety notice on petroleum based lubricants. In addition Shell Material Safety Data Sheets on such lubricants warn against prolonged and repeated skin contact since this may lead to a number of skin disorders including cancer."

The Agency has prepared status reports for a number of TSCA Section 8(e) submissions received on synthetic and petroleum fuels: 8EHQ-0029, 0030, 0044, 0082, 0083, 0117, 0148, 0212, 0215, 0216, 0217, 0238, 0240, 0247, 0252, 0253, 0297, 0301, 0306, 0316, 0323 and 0377. (These numbers represent the last four digits of the EPA Document Control Officer assigned numbers).

a) With regard to the 2-year mouse skin-painting study cited in this submission, the Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Shell Oil Company to provide all future interim reports and the final report as that information becomes available to the company.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to DOE, OSHA, NIOSH, OWWM/EPA, ORD/EPA, and OMSAPC/OANR/EPA. CHIB will also provide copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for appropriate distribution. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0381-0390
Page 1 of 5

DATE: APR - 2 1981

SUBJECT: Status Report*8EHQ-0381-0390

Approved JM 4/20/81

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Dow Chemical Company has reported that a review of a subset of Dow employee medical records has led to the discovery of a reported diagnosis of a malignant fibrous histiocytoma in an individual who had begun working in a trichlorophenol (TCP) process area in 1951. Dow reported that "during late 1963 and 1964, there was an outbreak of chloracne in the employees of this TCP process area apparently due to contamination of the process area with 2,3,7,8-tetrachlorodibenzo-p-dioxin." Dow also reported that this plant had been shut down in 1966.

Dow reported that in 1979, the company began "the third of a series of retrospective mortality cohort studies designed to evaluate the employees involved in the 1963-1964 chloracne outbreak." According to Dow, the above individual was one of 61 workers who had comprised the cohort study. Dow also reported that this individual smoked cigarettes. Dow stated that following the third study, "this currently active employee was reportedly diagnosed by his personal physician in late 1979 or early 1980 as having a malignant fibrous histiocytoma." Dow also stated that "the reported diagnosis came to Dow from an insurance report and was apparently routinely entered in the employee's medical record" and that the "entry was observed by the senior author of Dow's TCP cohort study on February 18, 1981 during a review of the records for other purposes."

Dow reported that the senior author is familiar with the results of several retrospective cohort studies conducted on U.S. workers presumably exposed to TCDD in which "three distinct histologically specific soft-tissue sarcomas have been reported." The following citations and summaries were provided by the Dow Chemical Company in its submission:

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

"Zack (1980a)[1]. A malignant fibrous histiocytoma. This individual had chloracne. He was a cigarette smoker. First exposure: 1948. This study of 121 men at Monsanto who were substantially exposed to TCDD after a TCP plant explosion in Nitro, West Virginia in 1949 found no excess of either total deaths or deaths due to cancer."

"Ott (1980)[2]. No chloracne nor soft-tissue sarcomas reported. This study of 204 men at Dow who worked in a 2,4,5-T [2,4,5-Trichlorophenoxy acetic acid] process area from 1951 to 1971 found fewer than expected total deaths and deaths due to cancer."

"Cook (1980)[3]. A fibrosarcoma. This individual developed a facial dermatitis, but no definitive diagnosis of chloracne was made. He was a cigarette smoker. First exposure 1964. This study of 61 men at Dow who were substantially exposed to TCDD in a TCP process area during 1963-1964 (this plant was shut down in 1966) found fewer than expected total deaths and no significantly greater than expected cancer deaths."

"Zack (1980b)[4]. A liposarcoma. Although the report does not indicate whether this individual had chloracne, it does mention that a number of men in his work area developed chloracne. He was a cigarette smoker. First exposure 1950. This study of workers in the 2,4,5-T process area at Monsanto's Nitro, West Virginia plant reported 58 deaths with a lower percentage of cancer deaths among this cohort than in another cohort of workers from the same plant who had not worked in the 2,4,5-T area."

With regard to the cited studies, Dow stated that "it is noteworthy that the information provided [above] involves, in all cases, past workplace conditions" and that those "conditions do not exist in today's workplace environment." In addition, Dow pointed out that "none of the four cited studies found any increased overall mortality, nor significantly increased mortality due to cancer" and that "in aggregate, while the studies reveal an apparent increase of soft-tissue sarcomas (albeit histologically distinct), overall cancer was substantially less than that expected in the general population."

With regard to studies conducted in Europe, Dow provided the following literature citations and summary:

"Hardell et al. (1979, and in press)[5,6,7]. Three case-control studies of Swedish males diagnosed with soft-tissue sarcoma or malignant lymphoma are interpreted by the authors as demonstrating an association between these diseases and prior exposure to phenoxy acids and/or chlorophenols but there is sufficient question concerning the methodology and alleged exposures that the studies are relatively uninformative regarding the health hazards potentially related to phenoxyacetic acid exposure."

In addition, Dow cited a recent article (Honchar; 1981)[8] that appeared in the British medical journal, Lancet, in which NIOSH scientists reportedly called attention to the European studies and noted that NIOSH is conducting both a retrospective cohort study and a case-control study in order to investigate the significance of the reported findings.

Dow reported that when the senior author of its TCP cohort study had discovered the diagnosed malignant fibrous histiocytoma, the author "considered it appropriate to report this information to interested government agencies and to the scientific community in order that this additional data point could be included in the planned studies." In addition, Dow reported that although a cause-effect relationship cannot be established at this time, the data "suggest the hypothesis that smokers who exhibit chloracne as a consequence of substantial TCDD exposure may be at increased risk of developing fibrous soft-tissue sarcomas. Until the hypothesis is tested and refined in a series of well-developed and conducted epidemiologic studies, [Dow is] unable to make a more definitive scientific judgment."

In conclusion, Dow stated that it no longer produces TCP in the U.S.A. and that Dow's operations outside the U.S. "have been modified over the years so that exposure to TCDD, a contaminant of trichlorophenol, has been virtually eliminated."

Submission Evaluation

Based on the nature of the provided information, a copy of Dow's submission was immediately transmitted to the EPA's "Chlorinated Dioxins Workgroup" for evaluation and appropriate followup attention.

Current Production and Use

The polychlorinated dibenzo-p-dioxins (PCDDs) are a series of tricyclic aromatic compounds which exhibit similar chemical and physical properties. The basic structure of the PCDDs has eight possible points of chlorine substitution. From the monochloro to the octachloro derivatives, a total of 75 different positional isomers is possible. Polychlorinated dibenzo-p-dioxins are impurities that may be formed as unwanted contaminants under certain conditions during the production of chlorophenols and certain other man-made chemicals. For example, 2,3,7,8-TCDD, which is one of the most acutely toxic chemical substances known to exist, has been identified as a contaminant produced during the manufacture of 2,4,5,-trichlorophenol (2,4,5-TCP). Because of this, the 2,4,5-trichlorophenoxy acetic acid (2,4,5-T) pesticide derived from 2,4,5-TCP becomes contaminated with 2,3,7,8-TCDD from the TCP intermediate. Findings of TCDD residues in the environment have come from analyses of soils and fish. In addition, TCDD residues have been detected in some abandoned chemical dumpsites. Recent evidence also indicates that TCDDs may be associated with emissions from general combustion processes.

Comments/Recommendations

In its submission, Dow stated that because the company considered it "appropriate that the scientific community be aware of this finding, only so that studies planned or underway may take this information into account, [Dow is] concurrently reporting this finding to the scientific community."

The Agency has received and evaluated several previous Dow Section 8(e) submissions on TCDDs and chlorophenols (8EHQ-0778-209 et seq.). The following U.S. Government panels are currently reviewing and evaluating information on dioxins: 1) U.S. EPA Workgroup on Chlorinated Dioxins, 2) Interagency Regulatory Liaison Group (IRLG) Dioxins Workgroup, and 3) Interagency Workgroup on the Long-term Health Effects of Phenoxy Acids and Their Contaminants. In addition, the EPA's Office of Research and Development (ORD) recently published (November, 1980) information on "DIOXINS" (EPA-600/2-80-197).

a) The Chemical Hazard Identification Branch will transmit a copy of this status report to OSHA, NIOSH, CPSC, FDA, and the EPA Chlorinated Dioxins Workgroup. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for appropriate distribution. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to industry-associated organizations.

References

1. Zack, J. A. and R. R. Suskind, "The Mortality Experience of Workers Exposed to Tetrachlorodibenzo-Dioxin in a Trichlorophenol Process Accident, "J. Occup. Med. 22:11 (1980).

2. Ott, M. G., Holder, B. B., Olson, R. D., "A Mortality Analysis of Employees Engaged in the Manufacture of 2,4,5-Trichlorophenoxyacetic Acid, "J. Occup. Med. 22:47-50 (1980).

3. Cook, R. R., J. C. Townsend, M. G. Ott, and L. G. Silverstein, "Mortality Experience of Employees Exposed to 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD), "J. Occup. Med. (in press).

4. Zack, J. A., "Mortality Study of Workers Employed at the Monsanto Company Plant in Nitro, West Virginia: (unpubished, Sept. 10, 1980).

5. Hardell, L. and A. Sandstrom, "Case-control Study: Soft-tissue Sarcomas and Exposure to Phenoxyacetic Acids or Chlorophenols," Br. J. Cancer 39:711-717 (1979).

6. Eriksson, M., Hardell, L., Berg, N. O., Moller, T., and O. Axelson, "Soft-tissue Sarcomas and Exposure to Chemical Substances. A Case-reference Study," Br. J. Ind. Medicine (in press).

7. Hardell, L., Eriksson, M., Lenner, P., and E. Lundgren, "Malignant Lymphoma and Exposure to Chemical Substances Especially Organic Solvents, Chlorophenols and Phenoxy Acids. A Case-control Study," Br. J. Cancer (in press).

8. Honchar, P. A., Halperin, E. E., LANCET, Number One, 268 (1981).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0381-0391
Page 1 of 2

DATE: MAR 31 1981

SUBJECT: Status Report* 8EHQ-0381-0391

Approved 4/29/81

Revision Needed ____________

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

Buckman Laboratories, Inc. has submitted the complete final results, including test protocols and data, from two short-term *in vitro* mutagenicity assays on 2'-hydroxyethyl-2,3-dibromopropionate (HEDBP; CAS No. 68479-77-6). According to the submitting company, the chemical was found to be positive in the *Salmonella*/Microsome Assay (Ames test) and the Mouse Lymphoma Forward Mutation Assay. The submitter stated that the results from both tests give corroborative evidence of the probable mutagenicity of HEDBP.

Submission Evaluation

This submission presented data on the mutagenic potential of 2'-hydroxyethyl-2,3-dibromopropionate (HEDBP) in the Ames *Salmonella*/Microsomal Assay and the mouse lymphoma L5178Y cell culture assay. HEDBP was found to elicit a positive response in both assays when tested with and without metabolic activation by an S-9 fraction from Aroclor 1254 induced male rats. In the bacterial assay, mutagenic potential and cytotoxicity were reduced but not eliminated by S-9 treatment. In the cell culture assay, cytotoxicity, but not mutagenicity, was reduced by metabolic activation. There is no basic inconsistency in these findings.

The protocols submitted indicate that these assays were performed according to accepted procedures. However, page 2 of the bacterial assay protocol indicated that the test agent was "a dark viscous liquid"; page 3 indicated that the test article was prepared by weighing 100 mg. The EPA questions whether "weigh" is the correct term to use in this context. The submitted protocol may be a "Standard Operating Procedure" (SOP) for solid compounds which was not changed to reflect the liquid nature of the test article.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

EPA FORM 1320-6 (REV. 3-76)

Current Production and Use

A review of the production range (includes importation volumes) statistics for 2'-hydroxyethyl-2,3-dibromopropionate (CAS No. 68479-77-6), which is listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a)). **/

In its submission, Buckman Laboratories, Inc. reported that it is the sole manufacturer of HEDBP and that the amount produced is between 10,000 to 100,000 pounds. The submitter also reported that HEDBP is manufactured for export only. No information on the use(s) of HEDBP was provided by the submitting company, nor was such information located in the secondary literature sources consulted.

Comments/Recommendations

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request Buckman Laboratories, Inc. to describe the actions it has taken, in light of the submitted toxicity data, to warn workers and others, and to reduce and/or eliminate exposure to HEDBP.

b) 2'-Hydroxyethyl-2,3-dibromopropionate will be considered for inclusion in future TSCA Section 8(a) Level A reporting.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH and OSHA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for appropriate distribution.

**/ The data submitted for the TSCA Inventory including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0381-0392
Page 1 of 2

DATE: APR 8 19

SUBJECT: Status Report* 8EHQ-0381-0392

Approved JM 4/20/81

Revision
Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Union Carbide Corporation submitted a summary of the final results from a series of acute and short-term inhalation studies of methyl isocyanate (CAS No. 624-83-9) in rats. Although no protocols or actual data were provided, the submitter reported that toxic effects were observed at the highest dose tested (3.07 ppm) but not at two lower doses. Union Carbide stated that in addition to irritation, histopathologic findings were noted and included inflammation and squamous metaplasia of the upper respiratory tract in some of the male and female rats studied. In addition, polyp formation was reportedly observed in the lungs of a few of the affected male rats. The submitter stated that the effects, which were observed after only 8 days of exposure to the highest dose, suggest that the experimental observations are worthy of additional examination. Union Carbide also stated that additional information will be provided to the EPA as planned toxicity studies proceed. The submitter also reported that "regular medical surveillance has shown no indication of any adverse health effects to Union Carbide employees working with this chemical."

Submission Evaluation

Methyl isocyanate is a highly active compound which is probably capable of alkylating a variety of tissues that contain amino (NH_2-) and hydroxyl (OH-) groups. It is not suprising, therefore, that inhalation of this chemical could cause a variety of lesions in the airways and lungs. Complete copies of the final reports of the cited studies, including test protocols and data, should be requested from the submitter.

Current Production and Use

A review of the production range (includes importation volumes) statistics for methyl isocyanate (CAS No. 624-83-9), which is listed in the initial TSCA Inventory, has shown that between 10 thousand and 100 thousand pounds of this chemical were reported as produced/imported in 1977. **/

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

According to secondary literature sources, methyl isocyanate is used mainly as an intermediate in the manufacture of pesticides.

Comments/Recommendations

The Union Carbide Corporation stated that it "commenced the manufacture of methyl isocyanate over 15 years ago, establishing strict operating controls and handling procedures to minimize risk of employee exposure." With regard to its Section 8(e) submission, Union Carbide stated that it is informing its employees and customers of the notice and will advise them of any further available information.

a) It is recommended that methyl isocyanate (CAS No. 624-83-9) be considered for inclusion in future TSCA Section 8(a) Level A reporting.

b) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Union Carbide Corporation to provide complete copies of the final reports, including test protocols and data obtained, from the series of acute and short-term laboratory studies of methyl isocyanate cited in its submission.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, and OPP/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for distribution. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to the manufacturers and/or importers of the subject chemical as listed in the Master TSCA Inventory, and to industry-associated organizations.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CF 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: MAY 11 1981

SUBJECT: Status Report* 8EHQ-0381-0393

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Approved JM 5/12/81

Revision Needed

Submission Description

The Dow Chemical Company has submitted a summary of preliminary findings from a 2-year feeding study (Fischer 344 rats) of two different compositions of FR651, which is reported to be a mixture of hexahalocyclohexanes containing 1,2,3,4,5-pentabromo-6-chlorocyclohexane (CAS No. 87-84-3) as the major constituent. According to Dow, the study was designed to evaluate the chronic toxicity and oncogenic potential of both "Compound A" (identified only as a single isomer) and "Compound B" (identified only as a mixture of isomers). Dow stated that the results of an interim sacrifice which was conducted following one year of dietary exposure indicated a slight, dose-related (higher doses only) toxicity, primarily in the liver and kidneys. Dow reported these findings to be consistent with those observed in a previously conducted 13-week subchronic study. Dow also reported that "the terminal sacrifice of all remaining rats was conducted after two years of dietary treatment, followed by preparation of microscopic slides of tissues and organs from all rats at all dose levels (those dying early as well as those surviving to termination)." Dow stated that the preliminary histopathologic examination of the tissues and organs indicated an apparent "increase in the incidence of proliferative lesions originating from the mucosal lining of the large intestine." Dow reported that the majority of these particular lesions have been tentatively diagnosed as polypoid adenomas, which appear morphologically identical to those observed as spontaneously occurring tumors noted at a background incidence rate of 0-3% in Fischer 344 rats in Dow's laboratory. Dow provided the following summarized preliminary data on the incidence rates of these large intestine tumors:

> "In the study with "Compound A", the preliminary numbers (percent) of male rats with a tumor of the large intestine mucosa are as follows: control group has 1/86 (1.2%), low dose group at 1 mg/kg/day has 1/50 (2%), the mid-dose group

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

> at 15 mg/kg/day has 0/50 (0%), and high dose group at 50 mg/kg/day has 5/50 (10%) affected. For the same tumor in the female rats, the control group has 1/86 (1.2%), the low dose group at 1 mg/kg/day has 0/50 (0%), the mid-dose group at 20 mg/kg/day has 3/50 (6%), and the high dose group at 70 mg/kg/day has 8/50 (16%) affected."
>
> "In the study with "Compound B", the preliminary numbers (percent) of male rats with a tumor of the large intestine mucosa are as follows: contol group has 1/86 (1.2%), the low dose group at 1 mg/kg/day has 0/50 (0%), the mid-dose group at 15 mg/kg/day has 2/50 (4%), and the high dose group at 50 mg/kg/day has 2/49 (4%) affected. For the same tumors in the female rats, the control group has 1/86 (1.2%), the low dose group at 1 mg/kg/day has 0/50 (0%), the mid-dose group at 20 mg/kg/day has 2/50 (4%), and the high dose group at 70 mg/kg/day has 9/50 (18%) affected."

Dow reported that because the histopathologic evaluation of the rats is not complete, the provided data are preliminary and are subject to change as the result of additional pathologic examination. Dow stated that its present interpretation is that "these preliminary data suggest an increased incidence of polypoid tumors of the large intestine in rats of the high dose groups. The incidence at the low dose level is comparable to the concurrent controls used in the studies and, therefore, appears to be a "no observed effect" level for the large intestine tumor response."

Dow reported that FR651 is known to have a low acute oral toxicity and to be nonmutagenic in Salmonella (Ames bacterial test). Dow also reported that this material, which has a melting range of 180-197°C and a maximum vapor concentration at ambient conditions of 0.05-0.06 ppm, is "slightly irritating to skin and eyes and the dusts may cause respiratory irritation." Dow stated that although FR651 does not appear on the Threshold Limit Value (TLV) list prepared by the American Conference of Governmental Industrial Hygienists (ACGIH), Dow's current Industrial Hygiene Guide recommends a workplace air concentration (TLV) of 5 mg/m^3 for FR651.

Dow also reported that "the environmental behavior of this material, as well as similar compounds, has been addressed in several studies, and it appears that this material does not persist in the environment. These data do not suggest a substantial risk of injury to the environment." The submitter provided literature citations for several of the mentioned studies.

Dow stated that the company believes that its "employees are not at increased risk as a result of these findings in laboratory rats. First, the circumstances of the workplace are such that employees are only intermittently working in the areas where the potential for exposure exists; and second, dust respirators and appropriate protective clothing (gloves, long-sleeved shirts, pants, for example) are recommended for use by employees intermittently working in work areas where exposures are likely to exceed the [Dow] Industrial Hygiene Guide."

Submission Evaluation

The summarized preliminary data provided in this submission appear to establish that Compounds A and B are oncogens. With regard to the submitter's statement that the lowest tested dose appears to be a "no observed effect" level, the EPA agrees that the reported incidence of intestinal tumors at the low dose is comparable to that reportedly observed in the control animals. However, the Agency does not at this time accept the concept of no observed effect levels or threshold levels for oncogenicity. It is possible that an increased tumor incidence might have become apparent in time and/or in a larger population of exposed animals. In order to further evaluate the reported findings, the submitter should be requested to provide complete copies of the interim and final reports including experimental protocols and toxicological data.

It should be noted that although the tested compounds are analogs of Lindane (gamma-hexachlorocyclohexane), their reported acute toxicity does not resemble that of Lindane. The acute and chronic toxicity of Compounds A and B appears to be more like that seen with numerous other polyhalogenated hydrocarbons (e.g. polybrominated biphenyls; PBBs).

With regard to environmental persistence, although the scientific articles cited by Dow provide information on a variety of halogenated compounds including Lindane (gamma-hexachlorocyclohexane) and its isomers, the cited studies do not contain any information on the environmental effects, fate, or persistence of 1,2,3,4,5-pentabromo-6-chlorocyclohexane or FR651.

Current Production and Use

A review of the production range (includes importation volumes) statistics for 1,2,3,4,5-pentabromo-6-chlorocyclohexane (CAS No. 87-84-3), which is listed in the initial TSCA Inventory, has shown that between 1 million and 10 million pounds of this chemical were reported as produced/imported in 1977.**/

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Dow reported that FR651 is a powder which is added to certain plastics as an ignition suppressant. Protective clothing and equipment are recommended by Dow in nonautomated operations in which the FR651 powder is transferred by hand. No other use information on FR651 or 1,2,3,4,5-pentabromo-6-chlorocyclohexane was located in the secondary literature sources consulted.

Comments/Recommendations

Dow stated that in accordance with its long-standing company policy, the reported toxicity information is being transmitted to employees and customers who handle FR651.

1,2,3,4,5-pentabromo-6-chlorocyclohexane (CAS No. 87-84-3) is listed in the EPA's February 29, 1980 proposed TSCA Section 8(a) Level A rule (45 FR 13646).

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Dow Chemical Company to provide the following information:

    1) complete copies of the final reports, including protocols and data, which were the source of the acute and 13-week subchronic toxicity findings cited in the submission;

    2) complete copies of all interim reports and the final report, including experimental protocols and data, from the 2-year feeding study cited in the submission;

    3) complete copies of results (including test protocols and data) from studies performed by and/or for Dow, or from studies in Dow's possession, which assess the environmental behavior of FR651 and/or its components;

    4) the exact chemical identity and amount (if known) of each of the isomer components in Compounds A and B.

b) The Chemical Hazard Identification Branch will consider the preparation of a Chemical Hazard Information Profile (CHIP) on 1,2,3,4,5-pentabromo-6-chlorocyclohexane and/or FR651.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH and OSHA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for appropriate distribution. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: APR 27 1981

SUBJECT: Status Report* 8EHQ-0381-0394 S

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Approved ______

Revision Needed ______

Submission Description

The 3M Company has submitted the final report of an oral rangefinder study of T-2998CoC in pregnant rats. T-2998CoC is referenced in the submitted report as FC-143, a homologous mixture of perfluoroalkane ammonium carboxylates.

According to the submission, the oral rangefinder study was conducted to determine the upper dose level of T-2998 CoC for a subsequent oral teratology study in rats. The report states that T-2998CoC was suspended in corn oil and administered daily by gavage at doses of 150, 100, 75, 50 or 25 mg/kg/day to groups of 6 time-mated Sprague-Dawley derived female rats on days 6 through 15 of gestation. A control group of 6 rats reportedly received only corn oil by oral intubation on the same days.

The report states that the animals were observed for abnormal clinical signs and weight gain and that blood samples and liver specimens were taken on day 20 of gestation. The report further states that four fetuses from each of four dams in the 150 and 25 mg/kg/day dose groups were examined for eye abnormalities because of teratogenic lens changes observed in earlier studies with chemically related compounds. The 3M Company previously submitted two final reports (8EHQ-0281-0373S Supplement and 8EHQ-0281-0374S Supplement) of teratology studies in rats on chemically related mixtures which reportedly produced a "developmental eye abnormality which appeared to be an arrest in development of the primary lens fibers forming the embryonal lens nucleus, followed by secondary aberrations of the secondary lens fibers of the fetal nucleus". The earlier submissions also referenced a published study conducted by 3M which reported elevated fluorochemical levels in the blood and urine of 3M fluorochemical plant workers.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

According to the present submission, although oral administration of T-2998CoC did not result in any deaths, a toxic effect of reduced body weight gain occurred between days 6 and 9 of gestation in the highest dose group. The submitted report also states that this effect was more severe in the two non-pregnant rats at 150 mg/kg level and that urinary incontinence was observed in one of these two animals on days 11 to 13 of gestation. No blood sample or liver specimen analyses were reported.

The submitted report states that all examined fetuses "had eye changes consisting of one or more of the following: large lens clefts, dark streak running one-half to three-quarters of the way through the lens or disorganized lens fibers." The report further states that the same general morphological changes occurred in the same location as those observed in the two previously submitted 3M teratology studies. In addition, the report states that the abnormalities seen in the present study appeared to be more pronounced.

The submitted report concludes that the results of the rangefinding study suggest that 150 mg/kg/day of T-2998CoC "would be an appropriate high dose in a rat teratology study because of the toxic effect of reduced body weight gain" and that the observed teratogenic effect of lens abnormality "is likely to be reproduced in a teratology study".

Submission Evaluation

The subject compounds resemble those previously reported by 3M (8EHQ-1180-0373S, 8EHQ-1180-0374S, 8EHQ-0281-0373S Supplement and 8EHQ-0281-0374S Supplement) in that they are acidic perfluoro compounds producing the same type of rare eye lens defect in the developing embryo. These compounds, which are analogs of fatty acids, may compete with fatty acids involved in growth and development or, more likely, inhibit an enzyme system necessary for organ development. For example, simple fatty acids such as valproic acid and its amide produce toxicity by interfering with GABA transaminase, carbamyl phosphate and cysteine synthesis.

Histological examination of the organs of both dams and fetuses would be extremely valuable in the planned teratology studies with FC-143 and/or other mixtures of perfluoroalkane ammonium carboxylates. In general, subchronic studies to determine toxicity, storage, and disposition of perfluoro compounds would also provide useful information.

Current Production and Use

T-2998CoC is identified by the submitter as a homologous mixture of perfluoroalkane ammonium carboxylates. The submitter states that each of the homologs was reported on the TSCA Inventory, but the chemical identities of these substances were claimed as "Confidential Business Information" by 3M.

According to the submitter, various mixtures of homologous ammonium carboxylates and the corresponding homologous carboxylic acids are currently commercially available and used as follows:

"Fluorad® Brand Fluorochemical Surfactant FC-143 (ammonium carboxylates)	Emulsifier used in chemical processing and as an additive in chemical specialty products.
"Fluorad® Brand Fluorochemical Surfactant FC-126 (ammonium carboxylates)	Additive used in chemical specialty products.
"3M Brand Fluorochemical Acid FC-26	Emulsifier additive in chemical specialty products (international market only)".

The submitter states that the subject chemicals are manufactured in a closed system from domestically produced and imported perfluoroalkane carboxylic acids. According to the submitter, perfluoroalkane carboxylates are exported annually, but export volumes were claimed as "Confidential Business Information" by 3M.

No other information on current uses of FC-143, FC-126 or FC-26 was located in the secondary literature sources consulted.

Comments/Recommendations

The 3M Company states that it plans to inform those customers and 3M employees who have, through uses and/or processing, potential significant exposure to the subject chemicals. To inform these customers and employees, 3M states that it will summarize the findings of the submitted study and outline 3M's recommendations for handling and using the products referenced in this submission. 3M also states that the company plans to advise these customers and employees of additional information, as it becomes available to 3M. The submitter further states that, in view of the submitted preliminary findings, the following program is planned for the ammonium carboxylate mixture: (1) a teratology study in rats; (2) a subsequent teratology study in rabbits; and (3) a continual industrial hygiene program to improve and refine manufacturing and packaging processes which have been developed to further reduce the exposure to plant employees.

The Agency recently learned (The Free Lance-Star, Fredericksburg, Virginia, Tuesday, April 7, 1981) that E. I. Du Pont de Nemours and Company, Inc., a 3M customer and user of FC-143, has reassigned 50 women employees of child-bearing age at one of its plants. This was in response to information provided to DuPont by 3M indicating that FC-143 had caused birth defects in rats in the oral range-finding study which is the subject of this submission.

The EPA has evaluated a previous 3M submission (8EHQ-1077-0011) in which it was reported that FC-70, a commercial product used as an electronics vapor soldering fluid, decomposes to highly toxic perfluoroisobutylene and an unidentified perfluoroimine when overheated. The EPA has also evaluated a series of 3M submissions (8EHQ-1180-0373S; 8EHQ-1180-0374S; 8EHQ-0281-0373S Supplement and 8EHQ-0281-0374S Supplement) on other perfluorochemicals which reportedly produced a developmental eye lens abnormality in rats.

a) The Chemical Hazard Identification Branch (CHIB/AD) will request the 3M Company to provide information on the amounts of each perfluoro homolog present in the commercial mixtures which are referenced in this submission. With reference to the submitted oral rangefinder study, the Chemical Hazard Identification Branch will request that 3M provide the results of blood and liver sample analyses, if performed. The 3M Company will also be asked if it plans to conduct complete histological examination of the organs of dams and fetuses in the planned teratology studies with the subject perfluoro mixture, and will be asked if further studies are planned to determine organ toxicity, storage, and disposition of perfluoro compounds.

b) The Chemical Hazard Identification Branch will consider the preparation of Chemical Hazard Information Profiles on selected chemicals within the class of perfluoroalkyl compounds.

c) It is recommended that chemicals within the class of perfluoroalkane ammonium carboxylates referenced in this status report be considered for inclusion in future TSCA Section 8(a) Level A reporting.

d) The Chemical Hazard Identification Branch will transmit a copy of this status report to OSHA, NIOSH, CPSC, CCD/EPA and OWWM/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/EPA) for appropriate distribution. The Industry Assistance Office (IAO/EPA) should consider sending the same information to industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE:

SUBJECT: Status Report 8EHQ-XXXX-0395

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

The Document Control Number 8EHQ-XXXX-0395 is VOID

EPA FORM 1320-6 (REV. 3-76)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0481-0396
Page 1 of 4

Approved JM 5/20/81

Revision
Needed

DATE: MAY 18 1981

SUBJECT: Status Report* 8EHQ-0481-0396

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

Martin Marietta Chemicals (Sodyeco Division) has reported that two dyestuffs have been found positive for *in vitro* mutagenicity in Ames (*Salmonella*) tests. The submitter stated that according to an oral report received from Burlington Industries (the sponsor of the performed tests), positive results were observed with Martin Marietta's SODYECRON Blue GBL powder (also known as Disperse Blue 291) and Eastman Blue RBS (manufactured by Eastman Chemical). Martin Marietta provided the following summarized findings from the performed Ames tests:

1.	SODYECRON Blue GBL Powder	Positive
2.	Yarn dyed with SODYECRON Blue GBL Powder	Negative
3.	Methylene chloride extract of yarn dyed with SODYECRON Blue GBL Powder	Positive
4.	Methylene chloride extract of yarn dyed with SODYECRON Blue GBL Powder and finished	Positive
5.	Ethyl Acetate extract of yarn dyed with SODYECRON Blue GBL Powder	Weakly positive
6.	Saline solution (synthetic perspiration) extract of yarn dyed with SODYECRON Blue GBL Powder	Negative
7.	Eastman Blue RBS dyestuff	Positive
8.	Yarn dyed with Eastman Blue RBS dyestuff	Negative
9.	Ethyl acetate extract of yarn dyed with Eastman Blue RBS dyestuff	Negative

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Martin Marietta stated that because correlations of results from Ames tests and animal studies can vary substantially according to both the reporter and the class of the compounds tested, the cited Ames test results "do not prove that a substantial risk exists."

According to Martin Marietta, 32 of its employees are exposed to the concentrated dyestuff during the manufacturing process, 62 employees are exposed in Martin Marietta testing laboratories, and an estimated 200 persons are exposed in its customer's textile dyeing plants. Martin Marietta states that all of these persons are exposed to low concentrations of the dyestuff for short periods of time.

Submission Evaluation

Although the submission does not indicate if the performed tests were carried out in the presence and/or absence of metabolic activation, it is apparent from the provided summarized results that both dyestuffs have some degree of *in vitro* mutagenic activity. However, without complete copies of the test protocols and data from the performed studies, evaluation of the reported results is not possible at this time. Complete copies of the final reports from the cited tests should be requested from the submitter.

Current Production and Use

Martin Marietta reported that its SODYECRON Blue GBL contains, in addition to various additives, an azo dyestuff (not identified by the submitter) which is also used in other Martin Marietta dyestuff products. No production information or specific use information on SODYECRON Blue GBL or Eastman Blue RBS was provided by Martin Marietta, nor was such information located in the secondary literature sources consulted. The submitter did not provide any information concerning the actual chemical identity and amounts of the various components of the tested dyestuffs.

Comments/Recommendations

Although the Agency agrees that a positive Ames test result is not sufficient in itself to *prove* that a risk exists, the Agency does believe that mutagenicity assays of this type provide valuable data that can aid in assessing possible risks posed by chemicals to health and the environment. In addition, the EPA believes that knowledge of high production of and/or exposure to the subject chemical would suggest the need for further more definitive toxicological testing.

Based on an initial review of the information contained in 8EHQ-0481-0396, the EPA believes that the submitted *in vitro* mutagenicity information alone does not appear to provide reasonable support for a conclusion of substantial risk pursuant to Section

8(e) of the Toxic Substances Control Act (TSCA; PL 94-469). The basis for the EPA's position, at this time, is as follows:

> The preface to Part V of the Agency's March 16, 1978, "Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" (43 FR 11110) states that "a substantial risk of injury to health or the environment is a risk of considerable concern because of (a) the seriousness of the effect...and (b) the fact or probability of its occurrence." With regard to the "fact or probability of its occurrence" criterion, Part V states that certain health effects are so serious that relatively little weight should be given to the chemical's exposure in determining whether a risk is substantial. With regard to the seriousness of the effect, Part V explains further that the Agency considers the health effects for which substantial risk information must be reported to include "any pattern of effects or evidence which reasonably supports the conclusion that the chemical substance or mixture can produce cancer, mutation, birth defects, or toxic effects resulting in death or serious or prolonged incapacitation." The information respecting these effects can be obtained directly or inferred from designed studies (e.g. in vitro experiments and tests as described in Part VI of the policy statement). However, with regard to the circumstances under which the results of an in vitro test should be reported, Part VI clarifies that the reporting of positive results from such a test (e.g. Ames test) will depend upon the existence of corroborative information if necessary to support the conclusion of substantial risk.

In view of the preceeding discussion, it is the EPA's preliminary determination that the in vitro Ames test results alone, as provided by Martin Marietta in the present notice, do not appear to have warranted submission to the Agency pursuant to TSCA Section 8(e). However, in making this preliminary determination, it must be understood that the EPA may not be aware of additional pertinent information which may have been available to and/or considered by the company in reporting the toxicity data under Section 8(e).

a) The Chemical Hazard Identification Branch will request Burlington Industries (test sponsor) to provide complete copies of the final results, including test protocols and data, from the Ames tests cited in this submission. In addition, CHIB will request both Martin Marietta and Eastman Chemical to provide information on the actual chemical identities (including CAS Numbers) and amounts of the components of SODYECRON Blue GBL and Eastman Blue RBS.

b) In view of the Agency's general interest in actions which are taken on a voluntary basis by companies in response to chemical toxicity/exposure information, CHIB will request Martin Marietta, Eastman, and Burlington to describe their actions taken to warn workers and others, and to reduce and/or eliminate exposure to the tested dyestuffs. In addition, CHIB will ask those companies if they plan to conduct additional studies designed to further define the toxicity of SODYECRON Blue GBL and/or Eastman Blue RBS.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, Martin Marietta, Eastman, and Burlington. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for appropriate distribution. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: JUL -6 1981

SUBJECT: Status Report* 8EHQ-0481-0397
8EHQ-0481-0397 Supplement

Approved 7/16

Revision Needed

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Wilmington Chemical Corporation has submitted (8EHQ-0481-0397) a copy of an Oak Ridge National Laboratory (Tennessee) draft report, entitled "Chronic [mouse] Dermal Toxicity of Epoxy Resins. I. Skin Carcinogenic Potency and General Toxicity." According to the Oak Ridge draft report, the study was an extension and continuation of a U.S. Department of Energy (DOE)-sponsored program to evaluate epoxy resins for potential occupational health risks.

The concluding abstract of the Oak Ridge draft report stated in part that "the skin carcinogenicity and systemic toxicity of six commercial epoxy resins and two amine curing agents were evaluated by continuous application of dilute acetone solutions to the skin of C3H mice for two years. Applied separately, 2 of the six resins were carcinogenic in mouse skin, with potency ranging from 1/200 to 1/200,000 that of benzo[a]pyrene. Both materials shown to be carcinogenic were previously untested in experimental animals. Positive synergism was noted between resins that were either non-carcinogenic or weakly carcinogenic under the prevailing assay conditions."

The epoxy resin and amine curing agent materials tested by Oak Ridge were reported as follows:

I. Epirez 508 (major component: 2,2'-[(1-Methylethylidene) bis (4,1-phenyleneoxymethylene)] bis oxirane; (CAS No. 1675-54-3).

II. Epon 828 (major component: 2,2'-[(1-Methylethylidene) bis (4,1-phenyleneoxymethylene)] bis oxirane; CAS No. 1675-54-3). (This product was reported to differ from I. with respect to proprietary modifiers).

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

III. Araldite 6010 (major component: 2,2'-[(1-Methylethylidene) bis(4,1-phenyleneoxymethylene)] bis oxirane; CAS No. 1675-54-3). (This product was reported to differ from I. with respect to proprietary modifiers).

IV. ERE 1359 (major component: 2,2'-[1,3-Phenylenebis (oxymethylene)] bis oxirane; CAS No. 101-90-6).

V. XB 2793 (major component: 5,5-Dimethyl-1,3-bis (oxiranylmethyl)-2,4-imidazolidenedione; CAS No. 15336-81-9).

VI. Heloxy WC-68 (major component: 2,2'-[2,2-Dimethyl-1,3-propanediyl) bis (oxymethylene)] bis oxirane; CAS No. 17557-23-2).

VII. ERR 4205 (major component: Bis (2,3-epoxycyclopentyl) ether; CAS No. 2386-90-5).

VIII. Apco 2330 (major component: 1,3-Benzenediamine; CAS No. 108-45-2).

IX. Menthane diamine (major component: 4-Amino -α,α-4-trimethylcyclohexanemethanamine (CAS No. 80-52-4).

X. Benzo[a]pyrene (positive control) (CAS No. 50-32-8).

In addition to the individual materials shown above, the various combinations tested in this study were reported as follows:

A. a 50:50 mixture of III and VII
B. a 70:30 mixture of V and VI
C. a 50:50 mixture of I and VII
D. a 50:50 mixture of II and VII

The Oak Ridge draft report stated that "treatment related skin neoplasms that were persistent, grew progressively and contributed to mortality were induced with materials V, VI, VII, X (positive control) and with all the resin mixtures (A,B,C,D)." The Oak Ridge draft report also stated that material VII was not applied separately in the present study because it had been previously tested by Oak Ridge. (Published results from this previous study (Holland et al., 1979) showed that test material VII was an active skin carcinogen in mice via chronic dermal application). In addition, the Oak Ridge report stated that previously published animal carcinogenicity studies revealed that material IV is capable of eliciting skin neoplasms in C57BL mice (Mc Cammon et al., 1957), but not in Swiss ICR mice (Van Duuren et al., 1965) following chronic dermal exposure. The Oak Ridge report stated that these previous findings were consistent with the present data which show that skin tumors were not induced by material IV in C3H mice, a strain which is reportedly less sensitive than C57BL mice to skin carcinogens. The draft report further stated that by using the highest exposure levels permitted by local or systemic toxicity to estimate oncogenic potential, the potencies of materials V and VI were an order of magnitude greater than that observed at the highest permissible dosages of material VII alone or in combination with material I, II or III. Also, the combination of V and VI (mixture B) reportedly induced a response comparable to that observed with V with no indication of synergism.

The draft report stated that, in general, male mice were more sensitive than female mice to skin tumor induction whereas female mice were more sensitive to systemic toxicity. In addition, the report stated that severe skin irritation induced by certain of the test materials did not correlate with skin carcinogenicity.

According to the Oak Ridge draft report, clinical hematologic and chemical analysis, as well as gross and microscopic evaluations, were conducted on individual animals. The draft report stated that correlations of clinical findings with gross and microscopic pathologic changes will be included in future reports.

In its submission, Wilmington stated that it manufactures Heloxy WC-68 (test material VI in the Oak Ridge study) and resorcinol diglycidyl ether (reported by Oak Ridge to be the major component of ERE 1359; test material IV). In a supplemental submission (8EHQ-0481-0397 Supplement), the CIBA-GEIGY Corporation stated that "one of the chemicals studied, 2,2'-[(2,2-dimethyl-1,3-propanediyl) bis (oxymethylene)] bis oxirane [the major component of test material VI], which we [CIBA-GEIGY] manufacture, was reported to be carcinogenic" in mice in the Oak Ridge study. CIBA-GEIGY stated further that the tested compound, although chemically identical to one that CIBA-GEIGY manufactures, was not manufactured nor supplied by CIBA-GEIGY for the Oak Ridge study. CIBA GEIGY also stated that "the epichlorohydrin content of the sample (batch) studied was conspicuously absent". In addition, CIBA-GEIGY stated that it was the company's experience" that epichlorohydrin impurities, if present in appreciable amounts, can significantly affect toxicological properties."

Submission Evaluation

The Oak Ridge study appears to be a substantial, well designed carcinogenicity bioassay of seven structurally different epoxy resins and various resin mixtures. There is no difficulty in identifying from the Oak Ridge draft report which two of the six resins were found in the present study to be carcinogenic via chronic dermal application to mice. These are test materials V and VI. The criterion used by Oak Ridge to compare the carcinogenic potencies of the different materials, i.e., the potencies relative to benzo[a]pyrene (used as the reference carcinogen) at the highest exposure level permitted by local or systemic toxicity, appears to be reasonable. It is by this criterion that compounds V and VI were judged by Oak Ridge to be carcinogenic. Test material VI also attracts attention as a potential systemic toxicant at levels of exposure that do not induce local irritation.

The CIBA-GEIGY supplemental submission noted that epichlorohydrin impurities, if present in appreciable amounts, can significantly affect toxicological properties and also noted that the presence of epichlorohydrin was not indicated for test material VI in the Oak Ridge study. It is of interest that of the five epoxy products for which the epichlorohydrin content was reported (i.e. I, II, III, IV and V), the only product displaying carcinogenicity in the present study was the one (material V) containing a 4-digit ppm concentration of epichlorohydrin. However, other observations in the present study seem to suggest that the epichlorohydrin content may not have been the uniquely determining factor. Test material VII showed an equivalent degree of synergism when tested in combination with I, II or III, despite the fact that each of these latter products reportedly contained low but differing levels of epichlorohydrin. As the Oak Ridge report states, this "suggest(s) strongly that synergism is between the principal components rather than reactive diluent or trace contaminants." It should be noted, however, that the Oak Ridge draft report did not contain any information on the epichlorohydrin content of VII. This information should be obtained, if available.

It is interesting that mixture B, the only mixture tested whose principal components (materials V and VI) displayed carcinogenicity when tested separately, exhibited additivity rather than synergism with respect to carcinogenic potential. In addition, there was no indication from the data presented in the draft report that clinical chemical or hematological irregularities were correlated with skin carcinogenicity.

Current Production and Use

Production statistics are reported below for the major components of the test materials IV, V, VI, and VII which were reported to be oncogenic either in the present Oak Ridge study or in previous studies cited in the draft report.

A review of the production range (includes importation volumes) statistics for 2,2'-[1,3-phenylenebis (oxymethylene)] bis oxirane (CAS No. 101-90-6; the major component of test material IV), which is listed in the initial TSCA Inventory, has shown that between 10 thousand and 100 thousand pounds of this chemical were reported as produced/imported in 1977. This production range information does not include any production/ importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. **/

A review of the production range (includes importation volumes) statistics for 5,5-dimethyl-1,3-bis(oxiranylmethyl)-2,4-imidazolidenedione (CAS No. 15336-81-9; the major component of test material V) and for bis(2,3-epoxycyclopentyl) ether (CAS No. 2386-90-5; the major component of test material VII), which are listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14(a) of TSCA, U.S.C 2613 (a)). **/

A review of the production range (includes importation volumes) statistics for 2,2'-[(2,2-dimethyl-1,3-propanediyl) bis (oxymethylene)] bis oxirane (CAS No.17557-23-2; the major component of test material VI), which is listed in the initial TSCA Inventory, has shown that between 100 thousand and 1 million pounds of this chemical were reported as produced/imported in 1977. This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information.**/

Epoxy resins constitute a broad group of chemical monomers that are used to produce commercial products such as surface coatings for household appliances, floors and wall panels, and adhesives for metals, glass and ceramics. No information on the specific uses of the tested materials was provided in the Oak Ridge draft report, in the original submission by the Wilmington Chemical Corporation or in the supplemental submission by the CIBA-GEIGY Corporation.

Comments/Recommendations

With regard to test material VI, in its supplemental submission (8EHQ-0481-0397 Supplement), the CIBA-GEIGY Corporation stated that "if we [CIBA-GEIGY] determine that these carcinogenic results could reasonably apply to our own product, we will advise our customers of this finding and modify our labels to reflect the carcinogenicity potential."

The National Institute for Occupational Safety and Health (NIOSH) has prepared a "Criteria Document" on Glycidyl Ethers (DHEW (NIOSH) Publication No. 78-166; June 1978). The Test Rules Development Branch (TRDB/AD/EPA) is currently reviewing information pertaining to "Glycidol and its Derivatives" as recommended by the Interagency Testing Committee (ITC).

The Agency has received and evaluated previous Section 8(e) submissions (8EHQ-0180-0328S and 8EHQ-0681-0328S Follow-up Response), in which the CIBA-GEIGY Corporation reported that XB 2793 (in a separate study) produced skin tumors in mice via chronic (life-time) dermal application.

**/ The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Oak Ridge National Laboratory to provide, when available, a copy of the final report of the present mouse skin painting study and a copy of future reports concerning this study. The Chemical Hazard Identification Branch will also request Oak Ridge to provide any available data on the epichlorohydrin content of test materials VI and VII.

b) The Chemical Hazard Identification Branch will request both the Wilmington Chemical Corporation and the CIBA-GEIGY Corporation to describe the actions they have taken, in light of the submitted toxicological information, to warn workers and others, and to reduce and/or eliminate exposure to epoxy materials found to exhibit oncogenic activity.

c) The Chemical Hazard Identification Branch will consider the preparation of Chemical Hazard Information Profiles (CHIPs) on 2,2'-[1,3-phenylenebis(oxymethylene)]bis oxirane (CAS No. 101-90-6); 5,5-dimethyl-1,3-bis (oxiranylmethyl)-2,4-imidazolidenedione (CAS No. 15336-81-9); 2,2'-[(2,2-dimethyl-1,3-propanediyl) bis (oxymethylene)] bis oxirane (CAS No.17557-23-2); and bis(2,3-epoxycyclopentyl) ether (CAS No. 2386-90-5), which were reported to be the principal chemical components of test materials IV, V, VI and VII, respectively. It also is recommended that these four compounds be considered for inclusion in future TSCA Section 8(a) Level A reporting. In addition, the Oak Ridge draft report will be screened in CHIB's Current Awareness Program for additional chemical candidates for further assessment.

d) The Chemical Hazard Identification Branch will transmit a copy of this status report to OSHA, NIOSH, CPSC, TRDB/AD/EPA, and the Oak Ridge National Laboratory. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/EPA) and the Industry Assistance Office (IAO/EPA) for appropriate distribution.

References

Holland JM, Gosslee DG and Williams NJ. 1979. Epidermal carcinogenicity of bis (2,3-epoxy cyclopentyl)ether, 1,1 bis(p-glycidyloxyphenyl)propane, and m-phenylenediamine in male and female C3H and C57BL/6 mice. Cancer Res. 39:1718-1725.

McCammon CJ, Kotin P and Falk HL. 1957. The carcinogenic potency of certain diepoxides. Proc. Amer. Assn. Cancer Res. 2:229-230.

Van Duuren, Orris L and Nelson N. 1965. Carcinogenicity of expoxides, lactones and peroxy compounds. II. J. Natl. Cancer Inst. 35:707-717.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0581-0398
Page 1 of 2

DATE: MAY 26 1981

SUBJECT: Status Report* 8EHQ-0581-0398

Approved JM 5/29/81

Revision
Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

The Gulf Mineral Resources Company has provided the summarized results of an acute aspiration toxicity test with Solvent Refined Coal (SRC)-II Middle Distillate in rats. According to the submitter, the tested substance was administered at a dose of 1.0 ml/kg of body weight into the oral cavity using a modified Gerarde technique. In addition to mortality (2/5 males and 2/5 females during the 24-hour study period), the submitter reported that the toxicity resulting from the SRC-II material included "significant statistical differences in absolute and relative (to body weight) lung weights and irritation of the lung tissue as evidenced by macroscopic examination at necropsy." The company also reported that "the mortality observed in the SRC-II Middle Distillate group further indicates that the test article results in lethal toxicity when administered in accordance with the decribed protocol in the Fischer 344 rat." In conclusion, the submitter stated that the observed effects are "well known and similar to comparable petroleum hydrocarbons", and that "there is no employee hazard because this material [SRC-II Middle Distillate] is not designed or intended to be ingested."

Submission Evaluation

Aspiration of hydrocarbon distillates of this type can bring about various adverse pulmonary changes ranging from pneumonitis, pulmonary edema, pneumonia etc. The lung changes can occur following exposure to the distillates via direct inhalation of mists or via any other aspiration pathway, including vomiting after oral ingestion.

Current Production and Use

Although there are several SRC substances listed on the TSCA Inventory, SRC-II Middle Distillate was not located. According to the submitting company, the production of SRC-II Middle

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Distillate is essentially limited to a Department of Energy (DOE) pilot plant operated by The Pittsburg & Midway Coal Mining Company at Ft. Lewis, Washington. No information on current production was provided by the submitter or located in the secondary literature sources consulted.

Comments/Recommendations

The Agency has prepared status reports for a number of TSCA Section 8(e) submissions received on synthetic and petroleum fuels: 8EHQ-0029, 0030, 0044, 0082, 0083, 0117, 0148, 0212, 0215, 0216, 0217, 0238, 0240, 0247, 0252, 0253, 0297, 0301, 0306, 0316, 0323, 0377 and 0389. (These numbers represent the last four digits of the EPA Document Control numbers).

a) The Chemical Hazard Identification Branch (CHIB/AD) will request the submitter to provide a complete copy of the final report, including protocol(s) and data, from the acute aspiration test cited in the submission. In addition, CHIB will request the Gulf Mineral Resources Company to describe the actions it has taken, in light of the reported toxicity, to warn workers and others, and to reduce and/or eliminate exposure to SRC-II Middle Distillate. CHIB will also ask the submitting company if it plans to conduct additional studies in order to further define the toxicity of the material.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to DOE, OSHA, NIOSH, OWWM/EPA, ORD/EPA, OANR/EPA, the EPA Alternate Fuels Workgroup, and the OTS Synfuels Workgroup. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) for appropriate distribution. The Industry Assistance Office (IAO/OTS/EPA) should consider sending the same information to industry-associated organizations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0581-0399 S
Page 1 of 3

DATE: JUN - 2 [illegible]

SUBJECT: Status Report* 8EHQ-0581-0399 S

Approved Jm 6/5/81

Revision Needed ________

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

Hercules Incorporated reported that a new high explosive was found to cause teratogenic and other embryo/fetotoxic effects following daily dermal applications to pregnant rats during the period of organogenesis. Although the exact chemical identity of the tested material was claimed by Hercules as TSCA Confidential Business Information (CBI), the sanitized version of the notice (which was provided by the company) indicates that the new high explosive is a mixture. According to Hercules, "Ten daily doses of 1850 mg (1 oral LD50)/kg/day/rat caused ectrodactyly [congenital absence of all or of only part of a digit] (1 fetus in each of 2 litters), late resorptions (35 in 18 litters), multiple skeletal malformations and at least three characteristic soft tissue defects - diaphragmatic hernia, major vascular anomalies in the area of the aortic arch and delayed development of kidney architecture (hydronephrosis)." The submitter also stated that "Ten daily doses of 185 mg/kg/day/rat did not cause any late resorptions, skeletal deformities or delayed kidney development in rats." However, the vascular anomaly was reportedly observed in one rat at the lower dose. Hercules noted that although the soft tissue examinations are not yet complete, the company has tentatively concluded that the "lower dose is marginally an effect level." Hercules also reported that the company is "planning an additional study on the mixture to determine a no-effect level."

Submission Evaluation

There are several types of explosives which can be absorbed through the skin. In the absence of control data or any indication of maternal toxicity, it may be assumed that sufficient amounts of the tested mixture component(s) were absorbed by the pregnant mothers to cause teratogenic effects. It is possible for chemicals to be of relatively low toxicity to the mother and at the same time be highly injurious to the developing fetus.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Although the submitter reports that an additional study will be conducted to determine a no-effect level for the new explosive, it should be noted that no-effect dose levels may vary considerably between species. A teratogenicity study in another species could provide valuable information for estimating safe levels and safety factors for human exposure.

Current Production and Use

Because the submitting company has claimed the actual chemical identity of the components in the tested high explosive mixture as CBI, a report based on production/importation range statistics from the non-confidential TSCA Inventory will not appear in this status report.

According to Hercules, the new explosive will replace certain high explosives now used in many commercially available blasting formulations and will be made in facilities which currently produce explosives. The submitter also reported that blasting agents, which usually contain approximately 25% high explosive, are sold and used in sealed units which, in most cases, limits user exposure to only that high explosive which may diffuse from its absorbing material through the casing of the sealed unit. Hercules stated that the company believes that the current industrial hygiene practices which are observed for the manufacture and use of explosive products will provide adequate protection of employees from the reported fetal effects.

Comments/Recommendations

In addition to the company's reported plans to conduct an additional teratogenicity study, Hercules stated that its employees and customers are being notified of the submitted toxicological findings.

a) The Chemical Hazard Identification Branch (CHIB/AD) will request Hercules to provide, when available, a complete copy of the final report, including test protocols and data, from the unfinished teratogenicity study in rats cited in its submission. CHIB will also request the company to provide complete descriptions of the results obtained from the other studies which have been conducted during the company's reported "comprehensive toxicological evaluation" of the new high explosive.

b) The Chemical Hazard Identification Branch will consider the preparation of a Chemical Hazard Information Profile (CHIP) on the new high explosive and/or its chemical components. The chemical components should also be considered as candidates for future TSCA Section 8(a) Level A reporting.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, MSHA, and CPSC. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0581-0400
Page 1 of 3

DATE: JUN - 4 1981

SUBJECT: Status Report* 8EHQ-0581-0400

Approved JM 6/12/81

Revision
Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

In a submission sent directly to the EPA Acting Administrator, the Upjohn Company reported that a squamous cell carcinoma has been verified at the site of repeated application during a lifetime mouse skin-painting study of 2,2-diethoxyacetophenone (DEAP; CAS No. 6175-45-7). According to the summarized information contained in the submission, this chronic study was initiated in April 1979, and involved the painting of undiluted DEAP (amount not specified) three times per week for the lifetime of 40 mice. The submitter reported that the initial tumor was observed on day 641 at which time there were 20 animals alive. The squamous cell carcinoma was reportedly verified on day 667 with 12 animals remaining alive.

In its submission, Upjohn also provided a copy of an "Early Warning Report" from the laboratory conducting the skin-painting study of DEAP, a copy of the DEAP Material Safety Data Sheet, the results of Ames *Salmonella* (bacteria) tests, and the summarized final results of acute range-finding toxicity studies in rats and rabbits. According to the provided summary toxicity reports, DEAP was found to be non-toxic in the *in vivo* acute range finding studies via ingestion (rats), skin penetration (rabbits), and inhalation (rats), and produced no acute eye injury (rabbits) and only trace skin irritation (rabbits). In addition, DEAP was reported to be negative both with and without metabolic activation in the performed Ames mutagenicity tests.

In conclusion, Upjohn stated that the company "has no knowledge of any toxic effects on its employees, customers, or others attributable to the chemical, or of any literature reports of such toxicological activity."

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

Although DEAP appears to have acute low toxicity, the compound is absorbable through the skin and can cause malignant changes at the site of repeated application. In reviewing the provided information, it is not quite clear whether the one mouse showing a tumor on day 641 is the same mouse that died with a squamous cell carcinoma. Because DEAP is a photosensitive chemical, there is an additional concern that exposure to the compound could result in non-cancerous skin lesions. Also, the sites of repeated skin application which showed no gross lesions could be examined histologically for cellular changes. The submitter should be requested to provide a complete copy of the final results from this life-time mouse skin-painting study of DEAP for further evaluation.

Current Production and Use

A review of the production range (includes importation volumes) statistics for DEAP (CAS No. 6175-45-7), which is listed in the initial TSCA Inventory, has shown that between 10 thousand and 100 thousand pounds of this chemical were reported as produced/ imported in 1977. **/

The Upjohn Company reported that its Fine Chemicals Division has been producing DEAP since early 1979 at a plant site in North Haven, Connecticut. Upjohn also reported that DEAP is specifically designed for use as photosensitive initiator in ultraviolet-cured inks, coatings and adhesives. The submitter stated that previously developed information (not specified) leads to the conclusion that a "significant portion" of the DEAP is consumed during photo-cure processes. However, the submitter also pointed out that a there is a remote possibility that trace amounts of DEAP may remain in final products.

Comments/Recommendations

Upjohn reported that the company is notifying its DEAP customers of the submitted results.

In this particular case, The Upjohn Company's submission of TSCA Section 8(e) information to the EPA Acting Administrator's office did not unduly burden the Agency's processing of the notice. However, it will be brought to the submitter's attention that the

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

substantial risk information reporting requirements (Part IX of the March 16, 1978, "Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" (43 FR 11110)) clearly specify that Section 8(e) notices are to be sent to the Document Control Officer, Management Support Division, Office of Toxic Substances (WH-557), Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460.

a) The Chemical Hazard Identification Branch (CHIB/AD) will request Upjohn to provide a complete copy of the final report, including protocols and data, from the life-time mouse skin-painting study of DEAP cited in the submission. In addition, CHIB will request Upjohn to provide a complete description of the information which was reportedly developed at an earlier date (including results of chemical analyses for residual DEAP, if performed) that forms the basis for the company's conclusion that a "significant portion" of the DEAP is consumed during photo-cure processes. CHIB will also request Upjohn to describe other actions the company has taken, in light of the reported toxicity information, to warn its workers and to reduce and/or eliminate exposure to DEAP.

b) The EPA has received and evaluated previous Section 8(e) submissions (Union Carbide Corporation; 8EHQ-1078-0251 et seq.) which reported that skin tumors were found in mice following repeated (life-time) dermal application of an analogous photoinitiator chemical (DBAP; 2,2-di(sec-butoxy)acetophenone). In view of the oncogenic effects reported in the present submission on DEAP, the Chemical Hazard Identification Branch will consider preparing a Chemical Hazard Information Profile (CHIP) on DEAP and will reconsider the preparation of a CHIP on DBAP. It is also recommended that both DEAP and DBAP be considered as candidates for future TSCA Section 8(a) Level A reporting.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC and OWWM/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) and the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: AUG 13 1981

Page 1 of 8

SUBJECT: Status Report* 8EHQ-1280-0401 S; and Supplements A and B; and Followup Responses A and B

Approved 8/13/81

Revision Needed

FROM: Frank D. Kover, Chief
Chemical Hazard Identification Branch

TO: Joseph J. Merenda, Director
Assessment Division

Submission Description

In its initial submission (FYI-OTS-1280-0098 S), the Stauffer Chemical Company provided on a "For Your Information" basis, a summarized preliminary report from a recently completed two-year feeding study of Fyrol FR-2 (1,3-dichloro-2-propanol phosphate (3:1); CAS No. 13674-87-8) in rats. Although Stauffer claimed the actual preliminary data to be Confidential Business Information (CBI), the company's cover letter stated that the Fyrol FR-2 was administered in the rats' diet at dose levels of 0, 5, 20 and 80 mg/kg/day. Stauffer reported that neoplastic changes were observed microscopically in the liver of the test animals and that the incidence of hepatocellular carcinomas was statistically significant at the 80 mg/kg dose but not at the lower doses. The submitter also reported that benign testicular interstitial cell tumors had been observed microscopically in the test animals. The submitter stated, however, that these "tumors are indigenous in the rat and are non-invasive." The submitting company also reported that there was a substantial incidence of interstitial cell tumors in both the control male rats and the treated rat groups.

In addition to the above in vivo findings, Stauffer reported that the results obtained from personnel monitoring in the Fyrol FR-2 manufacturing facility indicated "very low worker exposure (less than 10 ppb)" and that "medical surveillance programs of the workers have not shown any findings that could be attributed to exposure to Fyrol FR-2." In addition, Stauffer pointed out that published National Institute of Environmental Health Sciences (NIEHS) studies have shown that Fyrol FR-2 is "readily metabolized and relatively non-persistent in experimental animals." Stauffer also reported that it had previously provided Fyrol FR-2 scientific data, which apparently included negative results from an in vitro cell transformation assay, to the EPA Administrator's Toxic Substances Advisory Committee (ATSAC) in June, 1979.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

In its first supplemental submission (FYI-OTS-0181-0098 Supplement A), Stauffer provided a list of a number of in vitro and in vivo toxicity studies which the company had previously submitted to the Consumer Product Safety Commission (CPSC) and/or the EPA ATSAC workgroup. Stauffer reported that complete copies of all of the listed studies were being compiled and would be provided to the EPA (FYI-OTS-0281-0098 Supplement B). Supplement A also contained a copy of a Product Safety Information Sheet which included a summary discussion of the in vitro and in vivo toxicity of Fyrol FR-2. In addition, Stauffer provided a copy of a published scientific review article entitled "Flame-Retardant Chemicals in Textiles" (Ulsamer et al.; Clinical Toxicology; Vol.17; No.1; 1980).

Following a review of the reported preliminary oncogenicity/carcinogenicity findings on Fyrol FR-2, it was the EPA's preliminary determination that the subject information should have been submitted pursuant to Section 8(e) of the Toxic Substances Control Act (PL 94-469). Therefore, the Stauffer Chemical Company was requested to provide its rationale as to why the obtained carcinogenicity/oncogenicity data on Fyrol FR-2 was not submitted to the EPA pursuant to TSCA Section 8(e). Stauffer was informed that following an EPA review of the company's response, the Chemical Hazard Identification Branch (CHIB/AD) would, if warranted, deliver the subject information to the OTS Document Control Officer for appropriate handling and public filing as Section 8(e) substantial risk information.

With regard to the submitter's reported Fyrol FR-2 plant-site personnel monitoring and medical surveillance studies, the Stauffer Chemical Company was requested to provide complete descriptions of the protocols and results from those performed studies. In addition, Stauffer was requested to describe the actions the company had taken, in light of the provided carcinogenicity/oncogenicity information, to warn its workers and to reduce and/or eliminate exposure to Fyrol FR-2. With regard to the Fyrol FR-2 chronic feeding study, Stauffer was requested to immediately provide complete copies of any and all preliminary reports from that study which the company possessed and/or obtained in the future. In addition, Stauffer was requested to provide a complete copy of the final report, including protocols and data, immediately upon receipt of that information by the company.

In response to the Agency's requests, the Stauffer Chemical Company provided (FYI-OTS-0381-0098 S Followup Response A) the following documents, the contents of which were claimed by the company as Confidential Business Information (CBI): 1) the protocol for the two year rat chronic/oncogenic feeding study; 2) a report on plant-site personnel monitoring studies; 3) a report on the epidemiology study conducted at the manufacturing plant; and 4) a report on a 90-day neurotoxicity study.

Stauffer's response also contained the company's rationale as to why the previously described Fyrol FR-2 carcinogenicity/oncogenicity information was not submitted to the Agency pursuant to TSCA Section 8(e). Stauffer stated that the company "used the criteria outlined in EPA's March 16, 1978 "Statement of Interpretation and Enforcement Policy" to determine whether or not the FR-2 data are subject to the reporting mandates of Section 8(e). We [Stauffer] concluded that the data do not meet these criteria. We [Stauffer] disagree with EPA that the mere fact that an implicated chemical is in commerce constitutes sufficient evidence of exposure." In addition, Stauffer stated that although the company believed that the substantial risk criteria of the statute were not met, Stauffer had "voluntarily complied with the intent of Section 8(e) by reporting pertinent information to the EPA."

With regard to exposure, Stauffer reported that "measured workplace exposures to airborne FR-2, the most common source of occupational exposure, are extremely low. Data obtained by monitoring personnel in the manufacturing plant show less than 10 parts per billion FR-2 in air as an 8-hour time weighted average. These data are confirmed by workplace area samples taken from a customer's plant showing no detectable amounts of Fyrol FR-2." From this exposure data it is Stauffer's conclusion that "the risk of human cancer from Fyrol FR-2 is extremely low and that, based on the most conservative risk assessment models that are currently used, Fyrol FR-2 does not present a substantial risk of harm to human health or the environment."

With regard to the toxicity of Fyrol FR-2, Stauffer stated that although the preliminary data provided to EPA from the chronic feeding study "show a statistically significant incidence (10%) of hepatocellular carcinoma, in one species (rat) and at the high dose (80 mg/kg)", the "occurrence of tumors at the mid and low doses was not statistically significant." Stauffer also stated that the results of an in vitro malignant transformation test showed that "Fyrol FR-2 did not transform normal cells to malignant cells in a study designed to predict carcinogenic potential." Stauffer further stated that the results of in vitro and in vivo mutagenicity tests were negative with Fyrol FR-2. With regard to human health, Stauffer reported that "an epidemiology study conducted at the manufacturing plant shows no finding of cancer or other disease that could be attributed to Fyrol FR-2. While far from conclusive, the study is most encouraging." Stauffer also stated that the preceeding toxicity data "fail to demonstrate that FR-2 poses a substantial risk of adverse health effects in humans." In addition, Stauffer stated that "the occurrence of a significant incidence of tumors at only the high dose level is indicative of a threshold response. This is an important consideration in determining true carcinogenic potential and this threshold appears to be far above the extremely low levels of actual human exposure. In addition, the carcinomas do not appear until late in the animal's life cycle. This long time to tumor response at the high dose level is further evidence that, at lower exposures, the threshold of tumor occurrence can be pushed beyond the normal life span."

With regard to the environment, Stauffer again pointed out that the NIEHS metabolism tests on Fyrol FR-2 show that the compound "is metabolized quickly, is rapidly excreted and does not accumulate in test animals." Stauffer also stated that "the fact that FR-2 does not bioaccumulate suggests that it is not persistent in the environment and, thus, not an environmental hazard."

In summary, Stauffer stated that the company "disagrees with EPA that the preliminary data submitted are subject to TSCA Section 8(e). We [Stauffer] have adequate available data to judge that the risk of human cancer to exposure to Fyrol FR-2 is extremely low." In addition, Stauffer stated that the company "objects to EPA's placing the submitted FR-2 data in the public file as Section 8(e) substantial risk information."

Pursuant to the Agency's request for additional preliminary reports from the Fyrol FR-2 feeding study, Stauffer provided (FYI-OTS-0581-0098 S Followup Response B) a copy of a letter from the performing laboratory which contained a "preliminary, unaudited summary of neoplastic findings in the renal tissues of rats fed Fyrol FR-2 for two years." The actual information contained in the summary was claimed by Stauffer as Confidential Business Information (CBI). Stauffer reported that at the time of the followup submission, no distinction could be made between renal adenomas and renal carcinomas. In addition, Stauffer stated that the company anticipates receiving the chronic feeding study final report during the second quarter of 1981.

Submission Evaluation

In light of the reported preliminary toxicologic findings (i.e. the statistically significant incidence of hepatocellular carcinomas (malignancies) and the observed neoplastic changes), Fyrol FR-2 must be viewed as having demonstrated carcinogenic/oncogenic properties. Contrary to Stauffer's opinion, EPA does not at this time believe that the available data support the concept of a threshold for the carcinogenicity of Fyrol FR-2.

The summarized toxicity information contained in the provided product safety data sheet indicates that Fyrol FR-2 can be irritating to the skin and the eyes and is capable of being absorbed both from the gastrointestinal tract and from the skin. Fyrol FR-2 also appears to have some degree of neurotoxic activity as indicated by the signs and symptoms which were observed in laboratory animals and reported in both the provided material safety data sheet and the review article on flame retardants (Ulsamer et al.; Clinical Toxicology; Vol.17; No.1; 1980). The final report from Stauffer's recently conducted 90-day neurotoxicity study reports no clinical or histopathological evidence of neurotoxic activity for Fyrol FR-2. However, due to the restricted range of doses employed and the observed pathologic changes in the controls, EPA believes the results of this study to be indeterminate. EPA also believes that further more definitive experimental evidence would be needed in order to adequately characterize Fyrol FR-2's neurotoxic risk. With regard to reproductive effects, the EPA believes that the significance of fetotoxicity (reported in the product safety data sheet) following oral dosing in pregnant rats is not clear in light of the maternal toxicity which was also observed. In addition, based on a review of the provided epidemiologic study, the EPA believes that additional data and analyses would be needed in order to support Stauffer's statement that there was "no finding of cancer or other disease that could be attributed to Fyrol FR-2."

With regard to mutagenicity, there is some disagreement between the mutagenicity findings summarized in the provided Fyrol FR-2 product safety data sheet and the mutagenicity findings reported in the open literature. The provided product safety data sheet points out that Fyrol FR-2 does not induce gene (i.e. point) mutations in bacteria (Salmonella; Ames Test), yeast (Saccharomyces), fruit flies (Drosophila; sex-linked recessive lethal test), or in cultured mammalian cells (L5178Y mouse cells). The safety sheet also reports that urine from mice treated with Fyrol FR-2 does not cause mutations in bacteria. In addition, Fyrol FR-2 reportedly does not induce chromosomal aberrations in vivo (bone marrow assay; mice), does not induce sister chromatid exchanges in cultured Mouse Lymphoma L5178Y cells, and does not cause in vitro cell transformation (Balb 3T3 mouse cells.) The product safety data sheet states that in vitro chromosomal aberrations in mouse lymphoma cells (L5178Y) can be induced by Fyrol FR-2. According to the previously cited scientific literature review article on flame retardants (Ulsamer et al.; 1980), Fyrol FR-2 possesses weak (but significant) mutagenic activity when tested in the Ames/Salmonella bacteria assay in the presence of phenobarbital-induced mouse liver enzyme preparations, PCB-induced mouse liver enzyme preparations, phenobarbital-induced rat liver enzyme preparations, or phenobarbital-induced hamster liver enzyme preparations. The review article also indicates that Fyrol FR-2 can induce both sister chromatid exchanges and chromosomal aberrations in vitro (mouse L5178Y cells).

Current Production and Use

A review of the production range (includes importation volumes) statistics for 1,3-dichloro-2-propanol phosphate (3:1) (CAS No. 13674-87-8), which is listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a)). The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

The submitter reported that Fyrol FR-2 is used as a flame retardant. Additional information obtained by the Chemical Hazard Identification Branch/AD indicates that Fyrol FR-2 is recommended for use with cellulose acetate, ethyl cellulose, epoxies, phenolics, polyurethanes, polyesters, polystyrene, polyvinyl chloride, polyvinyl acetate, acrylics, other vinyls, and rubber. According to an article which appeared in Chemical and Engineering News (December 15, 1980), Fyrol FR-2 is used "mainly in flexible polyurethane foams for cushions in automobiles and in some furniture and also for mattresses."

Comments/Recommendations

In its initial FYI report, the Stauffer Chemical Company stated that in light of the preliminary scientific data from the Fyrol FR-2 feeding study, the company was reviewing other data and alerting its customers "to monitor their work environments and use good industrial hygiene practices." The submitter also reported that the Consumer Product Safety Commission (CPSC) had been notified and that the EPA would be "apprised of additional information as it becomes available." In Followup Response A, Stauffer reported that letters had been transmitted to customers, processors and users of Fyrol FR-2 notifying them of the report to EPA, and that follow-up presentations were made to customers by Stauffer's Director of Toxicology and Director of Occupational Medicine. Stauffer also reported that its Associate Director of Occupational Medicine held meetings at Stauffer's manufacturing facilities with workers involved in the manufacture of FR-2. In addition, Stauffer stated that the company is "assisting and cooperating with its customers to develop additional workplace monitoring data." Finally, Stauffer stated that "preliminary data have been collected which indicates no significant loss of FR-2 from end products such as urethane foam even at temperatures as high as 240°F." Stauffer is reportedly "conducting more extensive studies to confirm these preliminary findings."

Following a review of the Stauffer Chemical Company rationale concerning the Section 8(e)-applicability of the preliminary oncogenicity/carcinogenicity findings for Fyrol FR-2, it is the EPA's position that the subject information should have been formally submitted pursuant to Section 8(e), the substantial risk information reporting provision of the Toxic Substances Control Act (TSCA). The basis for the Agency's position is as follows:

> The preface to Part V of the Agency's March 16, 1978 TSCA Section 8(e) policy statement ("Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk"; 43 FR 11110), states that "a substantial risk of injury to health or the environment is a risk of considerable concern because of (a) the seriousness of the effect ...and (b) the fact or probability of its occurrence." With regard to the seriousness of the effect, Part V explains further that the Agency considers the health effects for which substantial risk information must be reported to include "any pattern of

> effects or evidence which reasonably supports the conclusion that the chemical substance or mixture can produce cancer..." The information respecting these effects can be obtained directly or inferred from designed studies (e.g. in vivo experiments and tests as described in Part VI of the policy statement). With regard to the "fact or probability of its occurrence" criterion, Part V also provides that certain health effects are so serious that relatively little weight should be given to the chemical's exposure in determining whether a risk is substantial. As stated in the policy statement, "the mere fact that an implicated chemical is in commerce constitutes sufficient evidence of exposure." That is, for the purposes of TSCA Section 8(e) reporting, a chemical's presence in commerce is considered by EPA to be presumptive evidence of sufficient potential for human exposure to warrant formal reporting of new evidence that the chemical is capable of causing a serious health effect such as cancer. Although Stauffer has provided information which indicates low (but measurable) worker exposure to Fyrol FR-2 and has reported that actions have been taken to further evaluate and reduce occupational exposure to the chemical, the available Fyrol FR-2 exposure data are both limited and preliminary, and do not in EPA's view, provide an adequate basis for rejecting the usual presumption that the chemical's presence in commerce warrants reporting of the obtained Fyrol FR-2 carcinogenicity data under Section 8(e).

It is the Agency's position that the information provided by the Stauffer Chemical Company offers reasonable support for a conclusion of substantial risk as defined in the EPA's March 16, 1978, Section 8(e) policy statement, and as such, should have been formally submitted by the company to the EPA pursuant to TSCA Section 8(e). Therefore, the Chemical Hazard Identification Branch has delivered Stauffer's FYI submissions on Fyrol FR-2 to the OTS Document Control Officer for appropriate handling and filing as TSCA Section 8(e) information.

The Chemical Hazard Identification Branch is currently preparing a Chemical Hazard Information Profile (CHIP) on 1,3-dichloro-2-propanol phosphate (3:1). The subject chemical is listed in the EPA's February 29, 1980 proposed TSCA Section 8(a) Level A rule (45 FR 13646).

The Stauffer Chemical Company has been responding to requests from the Management Support Division (MSD/OTS/EPA) that the company substantiate its claims for confidential treatment of information contained in several of the Stauffer submissions on Fyrol FR-2. The Office of General Counsel (OGC/EPA) is currently reviewing and will rule on the Stauffer Chemical Company claims.

a) The Chemical Hazard Identification Branch will again request the Stauffer Chemical Company to ensure that a complete copy of the final report from the chronic rat feeding study of Fyrol FR-2 is transmitted to EPA immediately upon the company's receipt of that report. In addition, CHIB will request Stauffer to submit complete copies of the actual data and analyses which were the basis for Stauffer's provided epidemiology report. Stauffer will also be requested to provide copies of any other epidemiology findings/reports on Fyrol FR-2, including protocols, underlying data, and analyses.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to OSHA, NIOSH, FDA, CPSC, OW/EPA, OSWER/EPA, ORD/EPA, OE/EPA, OGC/EPA, and the Executive Secretary to the EPA Administrator's Toxic Substances Advisory Committee (ATSAC). CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) and the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: [illegible] 1981

SUBJECT: Status Report* 8EHQ-0681-0402

Approved 7/16

Revision Needed ____________

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Union Carbide Corporation has submitted a summary of preliminary results from a nearly completed chronic mouse skin-painting study of Silane A-186 (beta-(3,4-epoxycyclohexyl) ethyltrimethoxy silane; CAS No. 3388-04-3). The submitter reported that Silane A-186 has been applied undiluted to the skin of 40 mice three times per week and that the study has been in progress for over two years. Union Carbide also reported that three of the starting 40 mice are still alive. Two of these remaining animals reportedly have grossly diagnosed skin carcinomas (malignant tumors) and the third mouse has a grossly diagnosed skin papilloma (benign tumor). In addition, the submitter reported that of the mice receiving Silane A-186 that died during the study, one had a histologically verified skin squamous cell carcinoma, one had a histologically verified fibrosarcoma near the application site, and three mice had suspect skin lesions at the application site. Union Carbide stated that the suspect lesions will undergo further examination by light microscopy.

With regard to mortality, Union Carbide reported that the mortality pattern for mice treated with Silane A-186 was similar to that observed for the control group of 40 mice receiving dermally applied acetone three times per week. The submitter stated that no local skin tumors have been observed in the acetone group. In addition, Union Carbide reported that all 40 mice treated (via dermal application) with 3-methylcholanthrene (positive control) had died by the end of the ninth month of the study and that all of the mice in that group developed malignant tumors at the site of application.

Union Carbide stated that "this dermal carcinogenesis test was undertaken after it was learned that Silane A-186 was mutagenically active in Ames, sister chromatid exchange and mouse lymphoma assays and weakly active in an unscheduled DNA repair test. We [Union Carbide] view these in vitro tests as corroborative of the chronic dermal carcinogenesis results." Union Carbide also stated that the company "has no knowledge of reports of any health hazards arising from the manufacturing and handling of Silane A-186, either from customers or employees, during 15 years of manufacturing and marketing of Silane A-186."

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Union Carbide reported that the chronic mouse skin-painting study of Silane A-186 is expected to be completed and a full report prepared by the last quarter of 1981. Union Carbide stated that the full report, when issued, would be submitted to the EPA.

Submission Evaluation

Epoxide rings are highly reactive and are capable of binding to a wide variety of chemical substances including many of those in biological systems (e.g. proteins, nucleic acids and other nucleophiles). In addition, many epoxides are known or are suspected to have oncogenic and/or other serious toxic properties in vivo. Beta-(3,4-epoxycyclohexyl)ethyltrimethoxy silane is an aliphatic cyclic epoxide which appears to be absorbed through the skin and can apparently react in epithelial cells to produce squamous cell carcinomas and in fibroblasts to produce fibrosarcomas. It should also be noted that the Silane A-186 molecule contains, in addition to the epoxide grouping, a second reactive area (i.e. the oxygens within the $-Si(-O-CH_3)_3$ grouping) which may also play a role in the reported oncogenicity of Silane A-186. Two structure/activity points provide the basis for this suspicion: 1) epoxycyclohexane and 1-ethyl-3,4-epoxycyclohexane have not been found to be carcinogenic following chronic application to the skin of mice, and 2) 1-vinyl-3,4-epoxycyclohexane, which contains both a reactive epoxide and a reactive vinyl group, has displayed carcinogenicity in mice following chronic dermal application (Arcos et al.; Chemical Induction of Cancer; Volume IIIA; In Press).

Further evaluation of the reported oncogenicity of Silane A-186 will have to await the receipt of other preliminary reports and the final report from Union Carbide's chronic mouse skin-painting study. In addition, Union Carbide should be requested to provide more detailed information from the performed in vitro mutagenicity studies of Silane A-186 which were viewed by the company as "corroborative of the chronic dermal carcinogenesis results."

Current Production and Use

Information concerning the use(s) of the subject chemical was not provided in the Union Carbide submission nor located in the secondary literature sources consulted.

A review of the production range (includes importation volumes) statistics for beta-(3,4-epoxycyclohexyl)ethyltrimethoxy silane (CAS No. 3388-04-3), which is listed in the initial TSCA Inventory, has shown that between 0 and 3 thousand pounds of this chemical were reported as produced/imported in 1977. **/

Comments/Recommendations

The Union Carbide Corporation stated that the company is advising its Silane A-186 customers and Union Carbide employees who are potentially exposed to Silane A-186 of the findings reported to EPA. The company also stated that NIOSH, OSHA, NCI and the American Conference of Governmental Industrial Hygienists (ACGIH) were being informed of the submitted information.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Union Carbide Corporation to provide complete copies of the final results, including protocols and data, from all of the in vitro tests which were cited in the submission.

b) The Chemical Hazard Identification Branch will consider the preparation of a Chemical Hazard Information Profile (CHIP) on beta-(3,4-epoxycyclohexyl)ethyltrimethoxy silane. In addition, it is recommended that this chemical be considered for inclusion in future TSCA Section 8(a) Level A reporting.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, NCI/NTP, and ACGIH. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) and the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

**/This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE JUL 21 1981

8EHQ-0681-0403 S
Page 1 of 3

SUBJECT Status Report* 8EHQ-0681-0403 S

Approved 7/23/81

Revision Needed

FROM Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The submitting company (name claimed as TSCA Confidential Business Information (CBI)) reported that an approximate 1:1 mixture of cobalt phthalocyanine monosulfonate and cobalt phthalocyanine disulfonate (CAS Numbers 30638-08-5 and 29383-29-7, respectively) was found to be positive in an in vitro mouse lymphoma cell forward mutation assay. According to the submitter, the mutagenic activity of this commercial product was observed only in the presence of a rat liver S-9 microsomal fraction (i.e. metabolic activation).

The submitting company stated that the subject mixture is in an aqueous slurry and is not volatile, and that the major route of human exposure is via dermal contact. The company estimates the potential human exposure to the mixture to be of a limited nature (i.e. approximately 900 persons). In making this estimate, the submitting company has taken into consideration its own employees, and those of its customers, and other persons such as transporters.

Submission Evaluation

When tested for mutagenicity in the in vitro mouse lymphoma L5178Y mammalian cell assay, the subject mixture was found to be nonmutagenic in the absence of metabolic activation. However, in the presence of metabolic activation, the mixture did demonstrate mutagenic activity. The source of activation was reported to be an S-9 preparation from the livers of male rats pretreated with Aroclor 1254. The assay results show that the tested mixture is mutagenic in cultured mammalian cells and requires metabolic activation in order to exert this activity. In addition, it should be noted that in a previous Section 8(e) submission (8EHQ-0980-0361 S et seq.), it was reported that cobalt phthalocyanine disulfonate, when tested alone, displayed mutagenic activity in the same mammalian cell assay and only in the presence of metabolic activation. Considering this previously reported result, it is possible that the mutagenic activity presently reported for the mixture of the disulfonate and monosulfonate compounds is due solely to the presence of the disulfonate compound. However, the results obtained from an assay of cobalt phthalocyanine monosulfonate alone would be necessary in order to allow a definitive statement to be made.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

A review of the production range (includes importation volumes) statistics for cobalt phthalocyanine monosulfonate (CAS No. 30638-08-5), which is listed in the initial TSCA Inventory, has shown that between 10 thousand and 100 thousand pounds of this chemical were reported as produced/imported in 1977. **/

A review of the production range (includes importation volumes) statistics for cobalt phthalocyanine disulfonate (CAS No. 29383-29-7), which is listed in the initial TSCA Inventory, has shown that between 100 thousand and 1 million pounds of this chemical were reported as produced/imported in 1977. **/

Use information on the chemicals was claimed as TSCA Confidential Business Information (CBI) by the submitting company. No information concerning the use(s) of the chemicals, either individually or as a mixture, was located in the secondary literature sources consulted.

Comments/Recommendations

The submitting company reported that the safety measures which are currently in force at its manufacturing facilities serve to ensure only minimal employee exposure. In addition, the company reported that steps are being taken to inform and warn its employees, customers, and others who may have potential exposure to the chemical mixture.

Although a positive *in vitro* test result, when considered alone, may not be sufficient to offer reasonable support for a conclusion of substantial risk, the EPA believes that *in vitro* studies do provide valuable data that can aid in assessing the possible risks posed by chemicals to health and the environment. The Agency also believes that a positive *in vitro* test result in

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**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

combination with additional information, such as knowledge of exposure to or high production of the chemical substance or mixture, would in many cases suggest the need for further, more definitive toxicologic study. The results obtained from such testing should also be reviewed and considered for possible submission to the EPA pursuant to Section 8(e) of TSCA.

The EPA has received and evaluated previous Section 8(e) submissions (8EHQ-0980-0361 S et seq.) which reported that, when tested separately, cobalt phthalocyanine disulfonate and cobalt phthalocyanine tetrasulfonate (CAS No. 14285-59-7) were found to be positive in mouse lymphoma forward mutation assays and only in the presence of metabolic activation.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the submitting company to describe any plans it has to conduct further, more definitive toxicological studies on cobalt phthalocyanine sulfonate compounds.

b) It is recommended that cobalt phthalocyanine monosulfonate (CAS No. 30638-08-5) be considered for inclusion in future TSCA Section 8(a) Level A reporting. The disulfonate and the tetrasulfonate compounds were previously recommended for future 8(a) Level A reporting consideration in the EPA status report prepared for submission 8EHQ-0980-0361 S.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH and OSHA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) and the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0681-0404
Page 1 of 2

DATE: JUL 22 1981

SUBJECT: Status Report* 8EHQ-0681-0404

Approved 7/23/81

Revision Needed ____________

FROM: Justine L. Welch, Team Leader JW
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Gulf Oil Company - U.S. reported that its Paralux 70 product had been found to display mutagenic activity or cell transforming ability in two short-term *in vitro* studies. According to the summarized information provided by the submitting company, Paralux 70 was found to be mutagenic in the Mouse Lymphoma Forward Mutation Assay. However, this activity was reported to have been observed only in the presence of exogenous metabolic activation. In addition, Gulf reported that Paralux 70 caused mammalian cell transformation in a C3H/10T ½ Cell Transformation Assay.

Submission Evaluation

The provided summarized results from the *in vitro* Mouse Lymphoma Forward Mutation Assay and C3H/10T ½ Mouse Cell Transformation Assay indicate that Paralux 70 has some degree of mutagenic activity and transforming ability in cultured mammalian cells. However, without complete copies of the final reports (including protocols and data), a more complete evaluation of the reported findings is not possible at this time.

Current Production and Use

The Gulf Oil Company - U.S. did not provide any information concerning the actual chemical identity of the component(s) of Paralux 70 or any information on the use(s) of the product. No use information was located in the secondary literature sources consulted.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Comments/Recommendations

The Gulf Oil Company - U.S. stated that the company is evaluating the significance of the reported toxicological findings in order to determine if any actions are warranted. In addition, the company reported that the results of further testing of Paralux 70 would be provided to the EPA.

Although a positive *in vitro* test result, when considered alone, may not be sufficient to offer reasonable support for a conclusion of substantial risk, the EPA believes that *in vitro* studies do provide valuable data that can aid in assessing the possible risks posed by chemicals to health and the environment. The Agency also believes that a positive *in vitro* test result in combination with additional information, such as knowledge of exposure to or high production of the chemical substance or mixture, would in many cases suggest the need for further, more definitive toxicologic study. The results obtained from such testing should also be reviewed and considered for possible submission to the EPA pursuant to Section 8(e) of TSCA.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Gulf Oil Company - U.S. to provide complete copies of the final reports, including test protocols and data, from the cited *in vitro* studies of Paralux 70. In addition, the submitting company will be requested to provide information on the actual identity (including CAS Number) and amount of each chemical component of Paralux 70. Considering the Agency's general interest in company actions which are taken on a voluntary basis in response to chemical toxicity/exposure information, CHIB will also request the submitter to describe the nature of the additional toxicity studies which are reportedly planned for Paralux 70 (or its chemical components) and the nature of any other health/safety-related actions taken.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, ORD, and DOE. In addition, CHIB will provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: AUG 27 1981

SUBJECT: Status Report* 8EHQ-0781-0405 S

Approved 9/2/81

Revision Needed

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

(Note: The submitting company has claimed both its identity and the actual identity of the chemical substance as TSCA Confidential Business Information (CBI). However, the company did report non-confidentially that the subject chemical was a zinc dialkyldithiophosphate (ZDDP)).

The submitting company provided a summary of preliminary results from a Chemical Manufacturers Association (CMA)-sponsored study designed to evaluate the reproductive toxicity of a zinc dialkyldithiophosphate (ZDDP). According to the submitter, the ZDDP compound was applied as a 25% dilution in mineral oil to the clipped, unabraded skin of rats and rabbits daily for five days per week for three consecutive weeks. The following table was provided and indicates the percent (%) change in mean values for the ZDDP-treated versus control animals at the end of the exposure:

	Body Weight	Epididymides Weight	Testes Weight
RABBITS			
Young animals	-9	-35	-55
Mature animals	-18	-28	-57
RATS			
Young animals	-27	-10	-1
Mature animals	-26	-5	-8

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

The submitting company reported that it had not performed, nor been apprised of, any statistical evaluations of the preceeding data. The company also reported that the rats and rabbits which were treated with the diluted ZDDP were subject to considerable stress caused by severe skin irritation at the sample application site. In addition, the submitter stated that the results of the CMA-sponsored study were not expected because a previous 21 day dermal application study of the undiluted ZDDP, (which was performed by the Illinois Institute of Technology Research (IITR) using a different protocol) did not show significant results with regard to testes/body weight ratios.

Submission Evaluation

The subject compound appears to have the same toxicity (i.e. skin irritation, reproductive system effects) as other chemicals within the ZDDP class. Further evaluation of the reported results will have to await the final report from the CMA-sponsored study. In addition, the negative results reported by the submitter from the IITR-performed ZDDP study cannot be evaluated without a complete copy of the final report, including test protocols and data. This information should be requested from the submitter.

Current Production and Use

In view of the fact that the submitting company has claimed the actual chemical identity of the subject ZDDP as TSCA Confidential Business Information, a review of the production/importation range statistics from the initial TSCA Inventory will not appear in this status report.

In general, compounds within the ZDDP class are widely used in lubricating oils and greases as anti-wear/anti-oxidant additives.

Comments/Recommendations

The submitting company stated that it does not believe that the subject ZDDP, when handled with appropriate care, poses any human health hazard. In addition, the company stated that its products which contain ZDDPs are adequately labelled in view of the currently available toxicity data to ensure proper handling. The company also reported that it is currently providing its customers of ZDDP-containing products with summaries of the available toxicity information related to the apparent reproductive system effects. In addition, the company reported that it plans to perform further studies in order to better evaluate the observed reproductive system toxicity and plans to continue to participate in the ongoing CMA-sponsored ZDDP study. The submitter stated that the EPA will be informed of additional findings from the latter study as they apply to the subject ZDDP compound.

The EPA has received and evaluated two previous TSCA Section 8(e) submissions on ZDDP compounds (8EHQ-0680-0346 et seq.; 8EHQ-0181-0387 et seq.). In light of the reproductive effects information provided in those submissions, the Chemical Hazard Identification Branch, in conjunction with the Chemical Control Division (CCD/OTS/EPA), is considering the preparation of a Chemical Hazard Information Profile (CHIP) on selected chemicals within the ZDDP class.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the submitting company to provide complete copies of the final reports, including protocols and data, from both the CMA-sponsored and the IITR-performed ZDDP studies cited in the submission.

b) The Chemical Hazard Identification Branch will review the information contained in the present submission and the requested final reports in considering the preparation of a Chemical Hazard Information Profile (CHIP) on selected ZDDP compounds.

c) It is recommended that the ZDDP compound which is the subject of the present submission be considered as a candidate for future TSCA Section 8(a) Level A reporting.

d) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, OW/EPA, OSWER/EPA, ORD/EPA, and CCD/OTS/EPA. A copy of the status report will also be provided to the Office of Toxics Integration (OTI/OPTS/ EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: AUG 27 1981

8EHQ-0781-0406 S
Page 1 of 3

SUBJECT: Status Report* 8EHQ-0781-0406 S

Approved 9/2/81

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Celanese Corporation reported that a proprietary mixture demonstrated mutagenicity in the following short-term *in vitro* assays: the Ames *Salmonella* bacteria test, the L5178Y Mouse Lymphoma assay, and the Chinese Hamster Ovary (CHO) Cell tests for chromosomal aberrations and sister chromatid exchanges. With regard to these mutagenicity findings, Celanese stated that it is the company's judgment that the mutagenic activity displayed by the proprietary mixture is due to the presence of an epoxy resin identified as glycerol polyglycidyl ether (CAS No. 25038-04-4). The submitter's judgment is reportedly based on negative results obtained from a previously performed Ames test on the other major mixture component (identity claimed as TSCA Confidential Business Information (CBI)), product literature and other (unspecified) information obtained from the supplier of the epoxy resin component, and a Celanese belief that the other minor components (identities also claimed as TSCA CBI) would not be responsible for the observed *in vitro* mutagenicity.

Submission Evaluation

The submitted final results do show that the proprietary mixture is mutagenic both in the presence and absence of exogenous metabolic activation in all of the performed *in vitro* tests. In the Ames test, *Salmonella* strains TA 100 and TA 1535 were found to be positive while strains TA 98, TA 1537, and TA 1538 were found to be negative. Although the submitter's judgment that the epoxy resin component is the agent responsible for the mutagenic activity may be valid, complete copies of the final report from the previously performed Ames test on the other major component should be requested for evaluation.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

A review of the production range (includes importation volumes) statistics for glycerol polyglycidyl ether (CAS No. 25038-04-4), which is listed in the initial TSCA Inventory, has shown that between 10 thousand and 100 thousand pounds of this chemical were reported as produced/imported in 1977. **/

The Celanese Corporation did not provide any information on the use(s) of the proprietary mixture (or its chemical components). Use information was not located in the secondary literature sources consulted.

Comments/Recommendations

The Celanese Corporation reported that copies of its TSCA Section 8(e) submission were being provided to NCI, OSHA, and NIOSH.

Although a positive *in vitro* test result, when considered alone, may not be sufficient to offer reasonable support for a conclusion of substantial risk, the EPA believes that *in vitro* studies do provide valuable data that can aid in assessing the possible risks posed by chemicals to health and the environment. The Agency also believes that a positive *in vitro* test result in combination with additional information, such as knowledge of exposure to or high production of the chemical substance or mixture, would in many cases suggest the need for further, more definitive toxicologic study. The results obtained from such testing should also be reviewed and considered for possible submission to the EPA pursuant to Section 8(e) of TSCA.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Celanese Corporation to provide a complete copy of the final report, including test protocol and data, from the Ames test which was reportedly performed on the other major chemical component of the proprietary mixture. Considering the EPA's general interest in company actions which are taken on a voluntary basis in response to chemical toxicity/exposure information, the Celanese Corporation will also be asked if it is conducting, or plans to conduct, additional studies to further define the toxicity of the proprietary mixture and/or its chemical components.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

b) Glycerol polyglycidyl ether (CAS No. 25038-04-4) should be considered as a candidate for future TSCA Section 8(a) Level A reporting.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, NCI/NTP, OW/EPA, OSWER/EPA, ORD/EPA, and TRDB/AD/EPA. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) and the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0881-0407
Page 1 of 2

DATE: SEP 4 1981

SUBJECT: Status Report* 8EHQ-0881-0407

Approved 9/8/81

Revision Needed ____________

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

E. I. Du Pont de Nemours & Company, Inc. has submitted a written report concerning an "Emergency Incident of Environmental Contamination (EIEC)" which involved an accidental release of approximately 4,000 gallons of fluorosulfonic acid (CAS No. 7789-21-1) following a railroad car derailment in Bridgman, Michigan. According to Du Pont, the accident occurred at 5 a.m. on August 7, 1981, and was reported by phone to EPA's Region V Office in Chicago, Illinois that same day. Du Pont reported that a vapor cloud, which resulted from the chemical's reaction with moisture in the atmosphere and estimated to be about 100 feet high, drifted away from the population center of Bridgman. Du Pont also reported that although the leaking tank car was sealed and the residual spilled liquid neutralized with limestone, local authorities did evacuate between 1,500 to 2,000 people near the accident site. Approximately 12 people were reportedly treated for skin and throat irritation but did not require hospitalization. With regard to damage to the surrounding environment, Du Pont stated that "some browning of the leaves has been observed." Du Pont reported that a railroad company coordinator has informed Du Pont that cleanup operations have now been completed at the site.

Submission Evaluation

Fluorosulfonic acid, which is also known as fluorosulfuric acid, is a colorless liquid which fumes when in contact with moist air. Both the liquid and fumes (depending on the concentration) can be corrosive and highly irritating to eyes and mucous membranes.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

Fluorosulfonic acid is a fluorinating agent. The chemical can be used as a catalyst in alkylation, acylation, polymerization, and condensation reactions. Secondary literature sources indicate that the compound is used in the hydrofluorination of olefins and in the production of substituted pyridines and certain petroleum products.

In view of the nature of the submitted information, a review of the production/importation statistics from the initial TSCA Inventory (1977) does not appear to be warranted at this time.

Comments/Recommendations

The Chemical Hazard Identification Branch (CHIB/AD/EPA) will forward a copy of this submission and status report to the EPA's Office of Emergency and Remedial Response/Office of Solid Waste and Emergency Response (OEER/OSWER) for review and any appropriate and warranted Agency followup actions. A copy of the submission and status report will also be transmitted to DOT, OW/EPA, ORD/EPA, OANR/EPA and to the EPA Region V Office in Chicago, Illinois. In addition, a copy of the status report will be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and the Industry Assistance Office for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0881-0408 S
Page 1 of 3

DATE: OCT 13 1981

SUBJECT: Status Report* 8EHQ-0881-0408 S

Approved 10/15/81

Revision Needed

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The submitting company (company name claimed as Confidential Business Information (CBI)) has provided the final reports from acute primary eye and skin irritation studies of stearylphenylethyldimethyl ammonium p-toluene sulfonate in rabbits. According to the submitter, the test results indicate that this quaternary ammonium compound is "extremely irritating to the skin and severely irritating/corrosive to the eyes of rabbits." In addition, the company reported that the subject chemical is newly synthesized and currently in research and development.

In the cover letter to its submission, the company stated its view that this Section 8(e) notice did not need to be filed "because it is merely corroborative of well established adverse effects already documented in the scientific literature...." and further stated that its notice was filed in order to avoid the risk that the EPA may differ with the company on the need for disclosure under TSCA Section 8(e). The company also provided a list of 12 literature citations which reportedly indicate the irritant action of quaternary ammonium compounds.

Submission Evaluation

Stearylphenylethyldimethyl ammonium p-toluene sulfonate closely resembles several of the cationic detergents and antiseptics used in medicine. The closest analog to the subject compound is cetyl dimethyl benzyl ammonium chloride which is one of the benzalkonium antiseptics. The 8(e) chemical differs mainly in that it has two additional $-CH_2-$ groups in the long chain alkyl group and one additional $-CH_2-$ group in the aralkyl group. The benzalkonium compounds are known irritants. It is therefore not unexpected that the 8(e) compound is also severely irritating, probably by virtue of its protein precipitant action.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

EPA FORM 1320-6 (REV. 3-76)

Current Production and Use

As previously stated, the subject quaternary compound was reported to be newly synthesized and in the research and development (R&D) stage. The submitting company reported that the CAS Number for the compound was unknown. The Chemical Hazard Identification Branch (CHIB/AD/EPA) has transmitted a copy of the sanitized submission to the Chemical Abstracts Service for assistance in locating, or possibly assigning, a CAS Number for the subject compound.

The company did not provide any information relating to the planned or potential use(s) of the compound. No use information was located in the secondary literature sources consulted.

Comments/Recommendations

Based on an initial review and evaluation of the toxicity information contained in 8EHQ-0881-408 S, the EPA believes that the provided acute rabbit eye and skin irritation study results did not warrant submission to the Agency pursuant to Section 8(e) of the Toxic Substances Control Act (PL 94-469). The basis for the EPA's position is as follows:

> The preface to Part V of the Agency's March 16, 1978, "Statement of Interpretation and Enforcement Policy; Notification of Substanitil Risk" (43 FR 11110) states that "a substantial risk of injury to health or the environment is a risk of considerable concern because of (a) the seriousness of the effect... and (b) the fact or probability of its occurrence." With regard to the seriousness of the effect, Part V explains further that the Agency considers the health effects for which substantial risk information must be reported to include "any pattern of effects or evidence which reasonably supports the conclusion that the chemical substance or mixture can produce cancer, mutation, birth defects, or toxic effects resulting in death, or serious or prolonged incapacitation." The information respecting these effects can be obtained directly or inferred from designed studies (e.g. in vivo experiments and tests as described in Part VI of the policy statement). With regard to the "fact or probability of its occurrence" criterion, Part V also provides that certain health effects are so serious that relatively little weight should be given to the chemical's exposure in determining whether a risk is substantial.
>
> The EPA's response to Comment 14 in Appendix B of the March 16, 1978 policy statement provides guidance with regard to the Section 8(e)-reportability of results obtained from routine acute in vivo range finding tests such LD50 determinations, irritation tests, etc. In its response, the EPA stated that it believes that "many routine tests are based on a knowledge of toxicity associated with a chemical..." The EPA's response also directs that unknown

effects which occur and are observed and/or determined during acute in vivo range tests may have to be reported if those effects are serious and meet the reporting requirements set forth in parts V and VI of the policy statement.

Thus when evaluating the results of acute animal toxicity studies for submission under TSCA Section 8(e), the Agency believes that submitting companies should consider such factors as the lethal dose, the route of administration, the occurrence of unexpected effects (which could be obtained via "cage-side" observations, during necropsy, etc.), and the extent and pattern of the exposure to the subject chemical substance(s). In general, when evaluating such information for Section 8(e) reporting, the greater the acute toxicity, the less heavily companies should weigh the tested chemical's exposure, and vice versa.

Based on the preceeding discussion and in light of the R&D status of the compound and the type of expected and observed acute in vivo effects (i.e. irritation), it is the EPA's preliminary determination that the results from the acute rabbit eye and skin irritation studies, as reported, did not warrant submission to the Agency pursuant to TSCA Section 8(e).

a) Considering the Agency's general interest in corporate actions which are taken on a voluntary basis in response to chemical toxicity/exposure information, the Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the submitting company to describe the actions it has taken, in light of the provided acute toxicity data, to warn workers and others, and to reduce and/or eliminate exposure to the subject chemical substance.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, ORD/EPA, OSWER/EPA, OW/EPA, and CCD/OTS/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: SEP 29 1981

8EHQ-0981-0409
Page 1 of 3

SUBJECT: Status Report* 8EHQ-0981-0409

Approved 9/29

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

Revision Needed ____________

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Velsicol Chemical Corporation has submitted two unpublished manuscripts which concern 3,3',4,4'-tetrachloroazobenzene (TCAB; CAS No. 14047-09-7) and 3,3',4,4'-tetrachloroazoxybenzene (TCAOB; CAS No. 21232-47-3). The first paper provides a literature review of the toxic effects of TCAB and TCAOB and includes information that the chloracnegenic and enzyme inducing potencies of TCAB and TCAOB are as great or greater than that of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD). The second paper provides an update and review of information on chloracne from exposure to TCAB and TCAOB. Velsicol stated that "the similarities between [TCAB and TCAOB] and TCDD are principally in the area of chloracnegenic potential."

Velsicol reported that both TCAB and TCAOB are impurities in 3,4-dichloroaniline (CAS No. 95-76-1), the pesticide methazole and pesticide products that are formulated from 3,4-dichloroaniline (diuron, linuron, and propanil).

Submission Evaluation

Although one of the submitted manuscripts does not appear to contain any new information, it is an excellent review of the literature on the toxicities of 3,3',4,4'-tetrachloroazobenzene and its azoxy derivative. The other manuscript is an extension of earlier observations (made in 1974) and contains new data which appear to "clinch the case" for outbreaks of chloracne in humans exposed to the TCAB and TCAOB. This manuscript also suggests that some of the exposed humans may have sustained long-term systemic effects, particularly photosensitization and hyperpigmentation.

As with other polychlorinated and polybrominated aromatic compounds, the acute toxicity of TCAB and TCAOB is low. The significant toxicologic effects are due to chronicity. The enzyme inducing potency of the TCAOB is as great as that observed for the chlorinated dibenzodioxins (TCDD) and dibenzofurans

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

(TCDF). The simple azo compound (TCAB) is one-fourth as potent, suggesting that the oxygen atom makes the azoxy compound isoelectronically closer to TCDD and TCDF.

One of the submitted manuscripts also contains highly significant information from an unpublished Du Pont 10 day sub-acute study in which 20 mg of TCAB was applied daily to the skin of ten (10) rabbits. After the 7th application, three (3) of the animals died. It is apparent that TCAB is significantly absorbed via the skin. In addition to the observed liver damage, the site of application was reported to be "thickened, crusty, and necrotic." These observations, in combination with other toxicologic information (e.g. the potent enzyme-inducing capabilities and chloracnegenic potentials of TCAB and TCAOB), indicate that TCAB and TCAOB have substantial xenobiotic activities which may include possible oncogenicity.

Current Production and Use

A review of the initial (1977) TSCA Inventory has shown that 3,3',4,4'-tetrachloroazobenzene (CAS No. 14047-09-7), 3,3',4,4'-tetrachloroazoxybenzene (CAS No. 21232-47-3), methazole (2-(3,4-dichlorophenyl)-4-methyl-1,2,4-oxadiazolidine-3,5-dione; CAS No. 20354-26-1), and propanil (N-(3,4-dichlorophenyl)propionamide; CAS No. 709-98-8) are not listed. **/

A review of the production range (includes importation volumes) statistics for 3,4-dichloroaniline (CAS No. 95-76-1), which is listed in the initial TSCA Inventory, has shown that between 100 thousand and 1 million pounds of this chemical were reported as produced/imported in 1977. **/

A review of the production range (includes importation volumes) statistics for diuron (N'-(3,4-dichlorophenyl)-N,N-dimethylurea; CAS No. 330-54-1), which is listed in the initial TSCA Inventory, has shown that between 100 thousand and 1 million pounds of this chemical were reported as produced/imported in 1977. **/

A review of the production range (includes importation volumes) statistics for linuron (N'-(3,4-dichlorophenyl)-N-methoxy-N-methylurea; CAS No. 330-55-2), which is listed in the initial TSCA Inventory has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and/or importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613(a)). **/

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

3,4-Dichloroaniline is used in the production of pesticides and as an intermediate in the manufacture of certain dyes. Diuron, linuron, propanil, and methazole are all registered pesticides. Because diuron and linuron are listed in the initial TSCA Inventory, the possibility exists that these particular compounds have uses other than as pesticides.

Comments/Recommendations

Because both TCAB and TCAOB are impurities in the pesticide product Technical Methazole (EPA Reg. No. 876-194), Velsicol stated that a copy of its Section 8(e) submission and a report of skin chloracne in workers exposed to Technical Methazole were being submitted separately to the EPA's Office of Pesticide Programs (OPP/OPTS/EPA) pursuant to Section 6(a)(2) of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

The Test Rules Development Branch (TRDB/AD/EPA) is currently reviewing chemical toxicity/exposure information on 3,4-dichloroaniline as it pertains to the category "Aniline and Chloro-, Bromo-, and/or Nitro- Anilines" which was recommended by the Interagency Testing Committee (ITC). In addition, 3,4-dichloroaniline is listed in the EPA's February 29, 1980 proposed TSCA Section 8(a) Level A rule (45 FR 13646).

a) The Chemical Hazard Identification Branch will request the Velsicol Chemical Corporation to describe the actions it has taken on a voluntary basis in response to the submitted information on TCAB and TCAOB, to warn workers and others, and to reduce and/or eliminate exposure to the subject chemicals.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, OW/EPA, OSWER/EPA, ORD/EPA, OPP/OPTS/EPA, TRDB/AD/EPA, and the EPA Chlorinated Dioxins Workgroup. A copy of the status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0981-0410/0411
Page 1 of 4

DATE: SEP 28 1981

SUBJECT: Status Report* 8EHQ-0981-0410
and 8EHQ-0981-0411

Approved 10/1

Revision Needed

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

In two separate submissions, the Celanese Corporation has provided a summary of preliminary results from a chronic mouse dermal application study involving triethylene glycol diacrylate (CAS No. 1680-21-3; 8EHQ-0981-0410) and tetraethylene glycol diacrylate (CAS No. 17831-71-9; 8EHQ-0981-0411). According to Celanese, doses of 50 mg of 5% solutions of the test chemicals in mineral oil were applied twice weekly for 18 months to the shaved backs of mice. The following table summarizes the preliminary findings which were reported by Celanese and judged by the company to indicate that the diacrylate compounds elicited weak oncogenic responses:

Test Group	Number of Animals	Prelim. Findings
Control	100	Tumors at the test site (0)
Positive Control (Benzo[a]pyrene)	50	Squamous Cell Carcinomas (52)
Triethylene Glycol Diacrylate	Not given	Squamous Cell Carcinomas (2) Microscopic Papillomas (2) Fibroma (1)
Tetraethylene Glycol Diacrylate	Not given	Squamous Cell Carcinomas (3) Microscopic Papillomas (2) Gross Lesion (1)*

* Tissue lost due to autolysis

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

The Celanese Corporation also reported that "preliminary and partial histologic examination of the internal organs [of mice treated with triethylene glycol diacrylate] showed an excess of lymphomas". The company also stated, however, that the significance of these particular findings cannot be assessed until histologic examination of all of the animals has been completed.

Submission Evaluation

Triethylene glycol diacrylate, tetraethylene glycol diacrylate, and neopentyl glycol diacrylate (which was the subject of 8EHQ-0178-0028 et seq.) should be considered together as a group. All three are primary skin irritants (sometimes severe) which produce neoplastic changes in the skin as well as skin malignancies. The three diacrylate compounds appear to adsorb to the stratum corneum of the skin and enter its reservoir. (The reservoir of the stratum corneum serves as a fixation or holding site for numerous applied drugs and chemicals which are subsequently removed in small amounts via absorption). From the reservoir, the diacrylates may be absorbed into the general blood circulation and distributed throughout the body. In this respect, the three diacrylate esters resemble the cellosolves and carbitols, some of which are skin irritants and skin sensitizers. In addition, some of these analogs with molecular weights in the range of triethylene glycol diacrylate are readily absorbed from the skin to produce a lethal outcome. The degree of systemic toxicity of the three diacrylate esters is determined by the rate at which they are removed from the reservoir into the blood. This rate is determined, in part, by the n-octanol/water distribution.

The physico-chemical properties of the skin barrier to penetration most closely resemble those of the chemical n-butanol. n-Butanol and closely related compounds can penetrate the skin, enter the reservoir and pass into the general circulation very readily. Triethylene glycol diacrylate, with its isosteric bis-n-butanol configuration comes the closest (of the three diacrylates) to n-butanol and would be expected to be absorbed more readily to give the highest blood and tissue levels. This could be verified by actual determinations in blood and urine.

The following is a speculation with regard to the fate of the three diacrylates following application to the skin:

1) Following adsorption onto the skin, some of the ester is hydrolyzed by esterases from bacteria which are normally resident on the skin surface. The acrylic acid which is released is an irritant.

2) The unhydrolyzed ester enters the reservoir where some is further hydrolyzed by skin lipases. The acrylic acid and the intact acrylate are epoxidized (the skin has metabolizing enzymes) to compounds that can react with macromolecules in cells of the germinal layer of the skin and thereby initiate local oncogenesis.

3) The rapidly absorbed intact ester (i.e. triethylene glycol diacrylate) reacts with blood plasma proteins and the reaction product is either filtered by the lymphoid tissue and/or brought to this tissue by phagocytes of the reticuloendothelial system. Lymphoid tissue is capable of producing epoxides from compounds which contain -C=C- groups. These epoxides would then initiate the oncogenic process.

4) Diacrylates which leave the reservoir more slowly (i.e. tetraethylene glycol diacrylate) would never reach a sufficiently high concentration in the blood to overcome the the normal capacity for neutralization by scavenging by cells of the reticuloendothelial system. This could account for the observation that triethylene glycol diacrylate produced internal lymphomas and the apparent failure of tetraethylene glycol diacrylate to do so.

Current Production and Use

A review of the production range (includes importation volumes) statistics for triethylene glycol diacrylate (CAS No. 1680-21-3), which is listed in the initial TSCA Inventory, has shown that between 110 thousand and 1.1 million pounds of this chemical were reported as produced/imported in 1977. **/

A review of the production range (includes importation volumes) statistics for tetraethylene glycol diacrylate (CAS No. 17831-71-9), which is listed in the initial TSCA Inventory, has shown that between 200 thousand and 2 million pounds of this chemical were reported as produced/imported in 1977. **/

The Celanese Corporation did not provide any information on the use(s) of either triethylene glycol diacrylate or tetraethylene glycol diacrylate. No use information was located in the secondary literature sources consulted.

Comments/Recommendations

The Celanese Corporation reported that the company was providing copies of its TSCA Section 8(e) submissions to the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), and the National Cancer Institute (NCI). Celanese also stated that a copy of the final results, when available, would be submitted to EPA.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

The Agency has received and evaluated previous TSCA Section 8(e) submissions (8EHQ-0178-0028 et seq.; Union Carbide Corporation) concerning the oncogenicity (via skin application in mice) of neopentyl glycol diacrylate (NPGDA; CAS No. 2223-82-7). A draft Chemical Hazard Information Profile (CHIP) on NPGDA has been prepared by the Chemical Hazard Identification Branch (CHIB/AD/EPA).

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Celanese Corporation to describe those actions taken by the company on a voluntary basis in response to the submitted toxicity information, to warn its workers, and to reduce and/or eliminate exposure to triethylene glycol diacrylate and tetraethylene glycol diacrylate.

b) The Chemical Hazard Identification Branch will consider the preparation of Chemical Hazard Information Profiles (CHIPs) on triethylene glycol diacrylate and tetraethylene glycol diacrylate. In addition, both compounds should be considered as candidates for future TSCA Section 8(a) Level A reporting.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, NCI/NTP, OW/EPA, OSWER/EPA, and ORD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0981-0412
Page 1 of 4

DATE: OCT 27 1981

SUBJECT: Status Report* 8EHQ-0981-0412

Approved 11/3

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Ethyl Corporation has submitted the final reports from a battery of short-term in vitro and in vivo genetic toxicology assays of ethylphosphonothioic dichloride (EPTD; CAS No. 993-43-1). According to the company, the potential genetic toxicity of EPTD is difficult to interpret because of the conflicting data obtained from the performed studies. The Ethyl Corporation also stated that interpretation of the submitted data is further confounded because there are no clear dose-responses in those assays in which EPTD demonstrated activity.

With regard to human toxicity, the Ethyl Corporation reported that extreme eye irritation occurs as a delayed effect following exposure to even minute concentrations (estimated by the company to be less than 0.1 ppm) of EPTD vapor. The company also stated that repeated exposure will not be tolerated because of the eye irritation. Ethyl reported that in its manufacturing facilities exposure to EPTD is essentially eliminated by the use of both engineering controls and personal protection.

Submission Evaluation

EPTD was tested in the following assays: in vitro mammalian cell specific locus mutation assay, with and without exogenous metabolic activation; in vitro mammalian cell transformation assay, with and without metabolic activation; in vitro Ames Salmonella (bacteria) assay, with and without metabolic activation; and in vivo mouse micronucleus and rat dominant lethal assays.

In the in vitro mammalian cell mutation assay, the ability of EPTD to mutate BALB/3T3 mouse cells to ouabain resistance was measured in the presence and absence of exogenous metabolic activation. In the absence of metabolic activation, there was no increase in the mutation frequency observed at any of the doses tested. The assay was clearly negative.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

The in vitro mammalian cell mutation test in the presence of exogenous metabolic activation was run twice. In the first test, no mutant colonies were observed in the solvent control, or in the two higher doses. However, at the lowest dose tested, there was a statistically significant increase in the mutation frequency. In the second test, although none of the concentrations resulted in significant cell killing, all doses resulted in a significant increase in the mutation frequency. Although one is led to wonder about quality control in these studies (because in the first test no mutant colonies were found in the solvent control while in the rerun, seven colonies were found in the solvent control), the performing laboratory was correct in considering these test results positive.

In the in vitro mammalian cell transformation assay, the ability of EPTD to induce morphological transformation of BALB/3T3 mouse cells was tested in the presence and in the absence of metabolic activation. In the test in the absence of metabolic activation, only the highest dose showed toxicity. There was no significant increase in the transformation frequency at any of the doses tested and the results were clearly negative.

As in the in vitro mammalian cell mutation assay, the in vitro cell transformation assay in the presence of metabolic activation was run twice. In the first test, EPTD caused a dose related increase in toxicity. The two lower doses and the solvent control gave no transformed foci while the highest dose produced two foci. The difference, however, was not statistically significant. In the repeat of this assay, the two lower doses caused no cellular toxicity while the highest dose killed all the test cells. The two lower doses (even in the absence of toxicity) caused a four fold increase in the transformation frequency when compared to the solvent control. While the induced transformation frequency at the highest dose was highly significant, the value at the intermediate dose was just below significance. The performing laboratory was correct in considering the results to be positive.

The Ames test was also run both in the presence and absence of exogenous metabolic activation. The results were clearly negative. However, because no toxicity data were provided, it is not known whether the compound was tested at high enough concentrations. In addition, the range of doses tested in the presence of metabolic activation was higher than that used for the assay without activation. In most cases, the reverse is done because added metabolic activation usually shows some toxicity.

In the in vivo mouse micronucleus test (MMT), two doses of EPTD (150 and 200 mg/kg) were given (i.p.) twice in a 48 hour period. The EPA finds this to be rather a poor choice of doses because they are very close. Although the results of the test were clearly negative, it should be remembered that the MMT is a relatively insensitive test utilizing a limited endpoint.

The dominant lethal test was performed in rats receiving EPTD orally at 100, 30 and 10 mg/kg/day for 5 consecutive days. The following endpoints were examined: fertility index, implantations per pregnant female, corpora lutea per pregnant female, pre-implantation losses per pregnant female, dead implants per pregnant female, proportion of pregnant females with one or more dead implants, proportion of pregnant females with two or more dead implants, and live implants per pregnant female.

The following statistically positive events were observed: an increase in pre-implantation losses on week 2 at 10 and 30 mg/kg and on week 5 at 100 mg/kg; an increase in dead implants per pregnant female at 30 mg/kg on weeks 3 and 5 and at 10 mg/kg on week 5; and a reduction in live implants at 10 mg/kg on week 5, at 30 mg/kg on weeks 1 and 2, and at 100 mg/kg on weeks 3 and 5. The contract laboratory considered these results negative because the positive events occurred in a seemingly random fashion. If one simply looks at statistical significance this is true. However, in many cases there were observed increases that were not statistically significant. The Agency would prefer to consider the outcome to be equivocal.

In general, the Agency agrees with the submitter that the genetic toxicity of EPTD is somewhat difficult to interpret. However, it is not unusual to have conflicting genetic toxicity data. This is one of the reasons for performing a battery of tests instead of just a single test.

With regard to the submitter's statement on dose response, it is almost always true in mutagenicity testing that the mutation frequency eventually plateaus with increasing concentration. The reason for this is unknown. Therefore, because only three concentrations were tested in the specific *in vitro* mammalian cell locus mutation test, the lack of an observed dose response may have resulted from two concentrations being on the plateau portion of the dose response curve.

With regard to the submitter's statements concerning eye irritation, it should be noted that a close analog to ethylphosphonothioic dichloride is thiophosphoryl trichloride ($PSCl_3$) which has a low water solubility resulting in a slow release of hydrochloric acid (HCl) via hydrolysis. The water solubility of ethylphosphonothioic dichloride would be expected to be even less and would result in a slower release of HCl. This could account for the delayed onset of eye irritation which was noted by the submitter. The possibility also exists for ethylphosphonothioic dichloride to react directly with -OH and $-NH_2$ groups in proteins and thereby cause irritation in tissues.

Current Production and Use

A review of the production range (includes importation volumes) statistics for ethylphosphonothioic dichloride (CAS No. 993-43-1), which is listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and/or importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613(a)). The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

The Ethyl Corporation reported that the company believes that it is the only domestic producer of ethylphosphonothioic dichloride. The Ethyl Corporation did not provide any information on the use(s) of the subject compound. No use information was located in the secondary literature sources consulted.

Comments/Recommendations

The Ethyl Corporation reported that in keeping with the company's policies on health and safety, all Ethyl employees and EPTD customers are being notified of the submitted information. In addition, the company reported that its customers have been advised to follow all protective measures that Ethyl uses in the manufacture of EPTD.

Although a positive short-term genetic toxicity test result, when considered alone, may not be sufficient to offer reasonable support for a conslusion of substantial risk, the EPA believes that such studies do provide valuable data that can aid in assessing the possible risks posed by chemicals to health and the environment. The Agency also believes that a positive short-term genetic toxicity test result in combination with additional information, such as knowledge of exposure to or high production of the chemical substance or mixture, would in many cases suggest the need for further, more definitive toxicologic study. The results obtained from such testing should also be reviewed and considered for possible submission to the EPA pursuant to Section 8(e) of TSCA.

a) Considering the Agency's general interest in company actions which are taken on a voluntary basis in response to chemical toxicity/exposure information, the Chemical Hazard Identification Branch (CHIB/AD/EPA) will ask the Ethyl Corporation if the company is conducting, or plans to conduct, additional studies to better define the potential toxicity of ethylphosphonothioic dichloride.

b) This submission on ethylphosphonothioic dichloride (CAS No. 993-43-1) will undergo chemical screening by the Chemical Hazard Identification Branch.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, OW/EPA, OSWER/EPA, and ORD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0981-0413
Page 1 of 5

DATE: OCT 8 1981

SUBJECT: Status Report* 8EHQ-0981-0413

Approved 10/15/81

Revision Needed

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Armak Company has reported that 2,2',4,4'-tetrachlorobiphenyl (a polychlorinated biphenyl; PCB) was formed as a result of a decomposition incident which occurred on September 1, 1981 at Armak's Noury Chemical Company plant in Burt, New York. According to Armak, a 600 pound mixture containing 2,4-dichlorobenzoyl peroxide, silicone oil, and dibutyl phthalate "rapidly decomposed" and resulted in the release of fumes and splattering of the reactants. The submitter reported that some Noury employees were burned and exposed to the released fumes. In addition, the submitter reported that some non-employees were exposed to the decomposed reaction products and fumes.

Approximately one pound of 2,2',4,4'-tetrachlorobiphenyl was estimated by Armak as having been generated during the decomposition incident. Armak reported that the finding of the subject PCB was first made on September 17, 1981, using electron capture gas chromatography and confirmed on September 19, 1981, using gas chromatography/mass spectroscopy (GCMS). The following analytical results were provided by Armak in its submission:

Source of Sample	2,2',4,4'-Tetrachlorobiphenyl (PPM)
Weed sample with white powder from decomposition (Outside Building 2B)	125
Field earth with white powder from decomposition (Outside Building 2B)	20
Inside mixer change can	1760
External mixer sample	1480
Mixer vacuum vent sample	1810

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

PCBs are among the most stable chemicals known. Once released into the environment, they decompose very slowly over a period of several decades. Due to this stability, they remain in the environment and can be taken up by organisms and accumulated in fatty tissues. This accumulation in organisms is significant because PCBs are hazardous to health at extremely low levels. Specifically, PCB's have been shown to cause chronic toxic effects in many species at less than 10 parts per million (ppm). There are well documented tests with laboratory animals demonstrating that PCBs can cause reproductive failures, gastric disorders, skin lesions, tumors, and other health effects of concern.

In man, PCBs can enter the body via the lungs, the gastrointestinal tract, and the skin. Following absorption, PCBs are circulated in the blood throughout the body and are stored in fatty tissue and a variety of organs, including the liver, kidneys, lungs, adrenal glands, brain, heart, and skin.

Based on the known reactivity (i.e. thermal instability) of benzoyl peroxides as a class, it is not suprising that the PCB, 2,2',4,4'-tetrachlorobiphenyl, was formed during the described decomposition incident. Upon heating, the 2,4-dichlorobenzoyl peroxide would be cleaved to the 2,4-dichlorobenzoyloxy radical which could then decarboxylate and couple to form 2,2',4,4'-tetrachlorobiphenyl.

Current Production and Use

Polychlorinated biphenyls (PCBs; CAS No. 1336-36-3) are members of a broad family of organic chemicals known as chlorinated hydrocarbons. Although PCBs may be produced naturally in the environment, almost all PCBs in existence today have been synthetically manufactured.

Primary uses of PCBs were, and continue to be, electrical transformer cooling liquids and capacitor dielectric fluids. Most of the PCBs marketed in the United States are still in service in these applications. However, PCBs have also been used in a variety of other applications such as heat transfer systems and hydraulic fluids; dye carriers in carbonless copy paper; plasticizers in paints, adhesives, and caulking compounds; fillers in investment casting wax; and as dust control agents, sealants, and coatings on roads.

PCBs have heavy oil-like consistencies, have high boiling points, and weigh approximately 10-12 pounds per gallon. Other important properties include: a high degree of chemical stability, low solubility in water, high solubility in fat, low flammability, and low electrical conductivity. These physical/chemical properties have made PCBs commercially attractive.

Legislative and Regulatory Actions on PCBs

A report by the President's Council on Environmental Quality (CEQ) in May, 1972, recommended that Congress enact the Toxic Substances Control Act (TSCA) to provide the regulatory authority required to deal with PCBs and other chemicals. Before the passage of the Toxic Substances Control Act, EPA could only regulate facilities that discharged PCBs into navigable waterways. On July 23, 1976, EPA proposed to ban the discharge of PCBs into waterways by electrical transformer and capacitor manufacturers (41 FR 30468). The final rule (42 FR 6532) was promulgated under Section 307(a) of the Federal Water Pollution Control Act (FWPCA) on February 2, 1977.

At the time the Toxic Substances Control Act was passed (1976), there was widespread recognition and concern regarding the serious, adverse effects PCBs have on the environment and human health. Congress responded to this problem by including a special section in TSCA (i.e. Section 6(e)) prohibiting future manufacturing, processing, distribution in commerce, and use of PCBs and providing for adequate marking and disposal of the PCBs still in use. Since then, EPA has implemented the provisions under Section 6(e) of TSCA. The following is a summary of these actions:

> On February 17, 1978, EPA promulgated the PCB Marking and Disposal Rule (40 CFR 761). In this rule, EPA established specific requirements for the marking and disposal of PCBs according to the nature and concentration of the PCBs in question.
>
> On May 31, 1979, EPA promulgated the PCBs Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions (PCB Ban Rule) (40 CFR 761). Specifically, this rule:
>
> 1) Prohibits all manufacturing of PCBs after July 2, 1979, unless specifically exempted by EPA;
> 2) Prohibits the processing, distribution in commerce, and use of PCBs, except in a totally enclosed manner after July 2, 1979, unless specifically authorized by EPA;
> 3) Authorizes certain processing, distribution in commerce, and use of PCBs in a non-totally enclosed manner;
> 4) Prohibits all processing and distribution in commerce of PCBs after July 1, 1979, unless specifically exempted by EPA.

It should be noted that the regulatory scheme developed in the PCB Marking and Disposal Rule and the PCB Ban Rule was designed to minimize exposure to humans and the environment while allowing the continued use of those PCBs which are totally enclosed or have been granted authorizations or exemptions. "Totally enclosed manner" was defined by Congress in TSCA to mean a manner which will ensure no significant exposure of human beings or the environment to PCBs, as determined by EPA by rule (Section 6(e) (2)(C). The final ban rule provides that human or environmental exposure to any detectable quantities of PCBs shall be deemed significant.

The use of intact, non-leaking PCB transformers, PCB-contaminated tranformers, electromagnets, and PCB capacitors and equipment containing such capacitors is considered a "totally enclosed" activity. However, servicing of such equipment is not considered a totally enclosed activity.

Congress provided a mechanism to allow exceptions to the statutory ban of non-totally enclosed activities (TSCA Section 6(e)) by permitting EPA to authorize some activities which are not totally enclosed. In order to authorize an activity, EPA must find that continuation of the activity does not present an unreasonable risk of injury to human health or to the environment.

Exceptions may also be made to the manufacturing ban or to the ban on PCB processing and distribution in commerce. TSCA refers to these exceptions as "exemptions" (Section 6(e)(3)(B). Before an exemption can be granted, there must be a determination that an unreasonable risk is not present and that good faith efforts have been made to develop substitutes for the PCBs.

The following non-totally enclosed activities have been granted authorizations until July 1, 1984: the servicing of PCB-containing transformers; the use of PCBs in heat transfer systems; the use of PCBs in hydraulic systems; the servicing of PCB electromagnets; the use of small quantities of PCBs for research and development; and the use of PCBs as a microscopy mounting medium. The use of PCBs in natural gas pipeline compressors was authorized until May 1, 1980. Authorizations until January 1, 1982, have been granted for the use of PCBs in mining equipment, the servicing of mining equipment, and the use of PCBs in pigments. Finally, due to the significant quantities of carbonless copy paper that contain small amounts of PCBs in government, industry, and personal files, the rule authorizes continued maintenance of such paper.

On May 9, 1980, the EPA, the Food and Drug Administration, and the Department of Agriculture, jointly published a proposed rule which would ban the use of PCBs (including PCB use in hydraulic systems) in facilities producing and/or storing agricultural chemicals, food, feed and food packaging (45 FR 30980). However, based on a 1980 court decision involving an Environmental Defense Fund (EDF) lawsuit, this proposed rule has been placed in abeyance pending the outcome of court-imposed re-evaluation (by EPA) of certain aspects of PCB regulations.

Although PCBs remain in use, EPA carefully considers the circumstances and conditions of each remaining use. Most of the remaining PCBs are in totally enclosed electrical equipment which will be replaced in the next few years as this equipment is serviced or retired. Most importantly, EPA has strict servicing, storage, and disposal requirements to protect against escape of PCBs into the environment. Further, authorization of each of the remaining uses will continue to be reviewed on a regular basis to ensure that they do not present an unreasonable risk of injury to human health and the environment.

Comments/Recommendations

In its submission, the Armak Company reported that on September 2, 1981, the EPA Region II Office in New York had been notified of the decomposition incident which had occurred the previous day. According to the Region II Office, the notification was received on September 14, 1981 pursuant to Subpart D of Part 265 of the Resource Conservation and Recovery Act (RCRA). Immediately upon receipt of Armak's TSCA Section 8(e) notice, the Chemical Hazard Identification Branch (CHIB/AD/EPA) contacted the Region II Office by phone and informed appropriate personnel of the reported PCB findings subsequent to the decomposition incident.

The EPA has received several other TSCA Section 8(e) submissions which have contained information on PCBs (8EHQ-0778-0209; 8EHQ-1079-0319; 8EHQ-0180-0330; and 8EHQ-0780-0352).

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will transmit a copy of this submission and status report to the PCB Team/CCD/OTS/EPA and the EPA's Region II Office for any warranted and appropriate followup attention.

b) The Chemical Hazard Identification Branch will also provide copies of the status report to OW/EPA, OANR/EPA, OSWER/EPA, and ORD/EPA, and to the Office of Toxics Integration (OTI/OPTS/ EPA) and the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: OCT 28 1981

SUBJECT: Status Report* 8EHQ-1081-0414

Approved 11/2/81

Revision Needed ____________

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Witco Chemical Corporation has provided a summary of the results from a 28-day dermal application study of Witco Hybase M-400 (alkylbenzene magnesium sulfonate; CAS No. 61789-87-5) which is reported to be a detergent additive in engine lubricating oils. Adverse testicular and liver effects were reported in rabbits exposed dermally to 100% Hybase M-400 at a dose of 2 ml/kg per day, 5 days per week for 4 weeks. The submitter reported, however, that no toxicologically significant effects were observed with Hybase M-400 applied as a 25% solution in mineral oil. In addition, Witco pointed out that the potential health hazard to users of lubricants containing Hybase M-400 is "extremely small because the observed 'no effect' level is 8 times the concentration of Hybase M-400 at its highest use level in finished lubricants."

Submission Evaluation

The chemical structure of the subject alkylbenzene magnesium sulfonate is not exactly clear. The possibility exists that this chemical is actually a complex micelle with a magnesium carbonate core. If this is the case, the compound could not be considered a simple magnesium salt. There is also the possibility that the tested Hybase M-400 product contains other chemicals such as carbitols or cellosolves which could explain the reported toxicologic observations for the 100% product and not the 25% dilution in mineral oil. Cellosolves and carbitols facilitate penetration through the skin while mineral oil (USP liquid petrolatum) may retard skin absorption.

Once the alkylbenzene magnesium sulfonate micelles are absorbed, they would be expected to release Mg++ slowly. The micelles would also be expected to be deposited in various organs, particularly those of the reticulo-endothelial system. This could explain the enlarged livers which were observed. The micelles would also be taken up by the testes where the effects could be two-fold: 1) deleterious effects of deposition; and 2) slow release of Mg++ and subsequent effects of Mg++ excess on the various enzyme processes involved in spermatogenesis in which Mg++ is a cofactor as well as a binder of nucleic acids.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

A review of the production range (includes importation volumes) statistics for alkylbenzene magnesium sulfonate (CAS No. 61789-87-5), which is listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and/or importer(s) and cannot be disclosed (Section 14(a) of the TSCA, U.S.C. 2613 (a)). The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Witco reported that Hybase M-400 and materials like it are widely used as detergent additives in engine lubricating oil. According to the company, finished lubricating oils typically contain from 1% - 3% by weight of the Hybase M-400 additive.

Comments/Recommendations

Witco Chemical Corporation stated that the only situations in which 100% Hybase M-400 is likely to be found are during its manufacture and the further preparation of finished lubricants. In addition, the company stated that "any potential health hazard is generaly well protected against by use of established good hygiene practices for this type of product, and the use of appropriate protective equipment." Witco also reported that its customers and employees were being notified of the submitted findings.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Witco Chemical Corporation to provide complete copies of the final report, including protocols and data, from the 28-day rabbit dermal application study of Hybase M-400. In addition, the submitter will be requested to provide the chemical structure for the alkylbenzene magnesium sulfonate identified in the submission as having the CAS No. 61789-87-5. Witco will also be requested to provide the chemical identity (including CAS Number) and amount of each component in Witco Hybase M-400.

b) Upon receipt of the requested information, the Chemical Hazard Identification Branch will consider preparation of a Chemical Hazard Information Profile (CHIP).

c) The Chemical Hazard Identification Branch will transmit a a copy of this status report to NIOSH, OSHA, CPSC, ITC, OW/EPA, OSWER/EPA, ORD/EPA, and OANR/EPA. A copy of the status report will also be provided to EPA's Office of Toxics Integration (OTI/OPTS/EPA) and Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1081-0415
Page 1 of 4

DATE: OCT 28 1981

SUBJECT: Status Report* 8EHQ-1081-0415

Approved 11/2/81

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

Revision
Needed ______

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Atlantic Richfield Company has provided a summary of the final results from several *in vitro* studies of 70% aqueous tertiary-butyl hydroperoxide (TBHP; CAS No. 75-91-2). According to the company, TBHP was found to be mutagenic both with and without metabolic activation in an Ames test and a mouse lymphoma cell mutation assay. Atlantic Richfield stated that the compound was several times less active in the presence of the activation mixture which "may indicate that TBHP can be readily metabolized in a whole animal to a much less genotoxic material." In addition, the company reported that TBHP did not induce transformation in a cell transformation assay (cell line not specified). Atlantic Richfield stated that this negative result indicates that "TBHP is not considered to have the carcinogenic potential of alkylating agents such as benzo(a)pyrene or 3-methylcholanthrene."

Atlantic Richfield reported that its testing of TBHP was begun because of two reports in the literature that the compound had been shown to be mutagenic in Ames tests. The company also reported that its TSCA Section 8(e) submission was based on its recently obtained positive mouse lymphoma cell mutation assay results.

Submission Evaluation

Without complete copies of the final reports from the performed studies, evaluation of the reported findings is not possible at the present time. There are, however, certain comments which can be made with reference to the submitter's statements concerning the reported results:

1. The submitter's statement that TBHP may be metabolized *in vivo* to a "much less genotoxic material" cannot be assessed in the absence of hard data. While *in vitro*

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

activity is an indication of the events which may occur in vivo, reduction of activity in the presence of in vitro enzyme activation does not in and of itself indicate reduced risk in vivo.

2. The submitter refers to lack of activity in a cell transformation assay and states that this implies that TBHP lacks the carcinogenic potential of benzo(a)pyrene (BP) and methylcholanthrene (MCA). This statement is not justified by the information in the report. There may be any number of reasons for negative results other than lack of carcinogenic potential. These include poor experimental design, insensitivity of the cell line used in the assay and inadequacy of the activation system. No mention is made of the cell line used in the study, the use of metabolic activation or other experimental details. It should also be noted that BP and MCA are not alkylating agents as stated in the submission, but are arylating agents which must always be metabolized to active intermediates (in the case of BP to a diol epoxide) to exert their mutagenic/carcinogenic effect.

Current Production and Use

A review of the production range (includes importation volumes) statistics for tertiary-butyl hydroperoxide (CAS No. 75-91-2), which is listed in the initial TSCA Inventory, has shown that over 1 billion pounds of this chemical were reported as produced/imported in 1977. **/

The chemical has many industrial uses. A major use of TBHP is as an intermediate in the production of propylene oxide and t-butyl alcohol from isobutane and propylene. The free radicals that are produced when TBHP undergoes reduction are highly reactive. TBHP is used as an initiator and finishing catalyst in the solution and emulsion polymerization methods of producing polystyrene and polyacrylates. Another use of TBHP is in the emulsion polymerization production of polyvinyl chloride. TBHP is an initiator for the polymerization and copolymerization of vinyl acetate. It is used as a curing agent in the thermoset of polyesters. TBHP is used in the production of t-butyl peroxyesters, such as t-butyl peroxybenzoate. In bleaching and deodorizing operations, TBHP is used as an oxidation and sulfonation catalyst. Two other possible industrial uses are as an anti-slime agent in cooling systems and as a settling agent in

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

the precipitation of various mineral tailings in aqueous slurries.

Comments/Recommendation

The Atlantic Richfield Company stated that it believes that the "precautions taken to avoid skin and eye irritations as described in the ARCO Chemical Company material safety data sheet (MSDS) for TBHP sufficiently limit exposure to prevent unreasonable risks of the mutagenicity effects indicated by the mouse lymphoma test results." The submitter also stated that the MSDS will be revised to incorporate the new toxicity information. Atlantic Richfield also reported that the ARCO Chemical Company will be notifying employees and customers of the submitted test results and reminding them of proper precautionary procedures. With regard to the summarized test results reported, Atlantic Richfield stated that copies of the final reports will be provided, when available, to EPA.

Although a positive *in vitro* test result, when considered alone, may not be sufficient to offer reasonable support for a conclusion of substantial risk, the EPA believes that *in vitro* studies do provide valuable data that can aid in assessing the possible risks posed by chemicals to health and the environment. The Agency also believes that a positive *in vitro* test result in combination with additional information, such as knowledge of exposure to or high production of the chemical substance or mixture, would in many cases suggest the need for further, more definitive toxicologic study. The results obtained from such testing should also be reviewed and considered for possible submission to the EPA pursuant to Section 8(e) of TSCA.

The Chemical Hazard Identification Branch (CHIB/AD/EPA) has an existing draft Chemical Hazard Information Profile (CHIP) on tertiary-butyl hydroperoxide. In addition, tertiary-butyl hydroperoxide (CAS No. 75-91-2) is listed in the EPA's February 29, 1980 proposed TSCA Section 8(a) Level A rule (45 FR 13646).

a) Considering the EPA's general interest in company actions which are taken on a voluntary basis in response to chemical toxicity/exposure information, the Chemical Hazard Identification Branch will ask the Atlantic Richfield Company if it is conducting, or plans to conduct, additional studies to further define the toxicity of TBHP.

b) The Chemical Hazard Identification Branch will send a copy of its existing draft Chemical Hazard Information Profile (CHIP) on tertiary-butyl hydroperoxide to the submitting company. The Chemical Hazard Identification Branch will also consider updating the existing draft CHIP to include a discussion of the *in vitro* findings reported in the submitter's TSCA Section 8(e) notice on the subject chemical.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, ORD/EPA, OW/EPA, and OSWER/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EFC-1081-0416
Page 1 of 2

DATE: OCT 13 1981

SUBJECT: Status Report* 8EHQ-1081-0416

Approved ____________

Revision
Needed ____________

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Great Lakes Chemical Corporation reported that a shipping container, holding an estimated 500 5-gallon pails of chloropicrin (CAS No. 76-06-2), was dropped on August 18,1981, as it was being unloaded from a ship at the Port of Long Beach in California. According to Great Lakes, the accident resulted in damage to several of the pails and leakage of chloropicrin onto the dock. Great Lakes reported that the entire dock was shut down and that 3 ships which were being unloaded were evacuated during the incident and the subsequent clean-up and disposal (in a Class 1 dump site). The company also reported that 2 local fireman and 9 longshoremen received medical attention at a nearby hospital. Great Lakes stated that of the 11 men affected, 10 were treated and released and the remaining individual left the hospital on his own accord although it was recommended that he be admitted for observation The Great Lakes Chemical Corporation also reported that the chemical and biological properties of chloropicrin are generally recognized and that the chemical leak (estimated by the company to have been less than 50 gallons) was quickly contained.

Submission Evaluation

Chloropicrin is a highly irritating compound which can also cause nausea and vomiting. Because the chemical is extremely efficient in bringing about these latter effects, chloropicrin was used during World War I as a chemical warfare agent. The toxicity of chloropicrin itself is intermediate between that of chlorine and phosgene. The more serious after-effects of exposure to chloropicrin may be anemia, cardio-vascular changes, and, most importantly, respiratory problems such as chronic bronchitis or asthma.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

A review of the production range (includes importation volumes) statistics for chloropicrin (CAS No. 76-06-2), which is listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and/or importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a). **/

According to Great Lakes, chloropicrin is a currently registered pesticide under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Secondary literature sources indicate that the compound is also used in organic synthesis, in the preparation of dye-stuffs, and as a poison gas.

Comments/Recommendations

Upon receipt of the Great Lakes Section 8(e) submission, the Chemical Hazard Identification Branch (CHIB/AD/EPA) contacted the EPA's Region IX Office (San Francisco, California) in order to ensure that that Office was aware of the reported incident. Region IX staff stated that their Office had been notified by the U.S. Coast Guard on the day of the incident.

a) The Chemical Hazard Identification Branch will transmit a copy of the Great Lakes Section 8(e) submission and this status report to the Office of Solid Waste and Emergency Response (OSWER/EPA) and to EPA's Region IX Office for any warranted and appropriate followup attention.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, ORD/EPA, OANR/EPA, OW/EPA, and OPP/OPTS/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

**/ The data submitted for the TSCA Inventory including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1081-0417
Page 1 of 2

DATE: OCT 23 1981

SUBJECT: Status Report* 8EHQ-1081-0417

Approved 10/20

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Union Oil Company of California has submitted the final report from an *in vitro* Mouse Lymphoma Forward Mutation Assay of L-11, which is reported by the submitter to be a reduced syncrude shale oil. According to the submitter, L-11 was found to be mutagenic only in the presence of exogenous metabolic activation.

The company also provided the final report from an acute inhalation toxicity study of the vapor fraction of L-6 syncrude shale oil in rats. According to the submitted report, LC50 values of greater than 1.8 and 2.1 mg/liter (on a Time-Weighted Average (TWA)) were estimated for male and female rats, respectively.

Submission Evaluation

With regard to mutagenicity, the provided final data demonstrate that L-11 is capable of inducing a concentration-dependent increase in the mutation frequency at the TK locus of cultured L5178Y mouse lymphoma cells in the presence of an exogenous source of metabolic activation. The data also demonstrate that this mutagenic activity does not occur in the absence of exogenous metabolic activation.

Although no data were presented for control animals, the acute *in vivo* toxicity report indicates that inhalation of L-6 syncrude vapor results in some degree of lung, kidney, and liver toxicity. Without histopathological examination, the exact nature of this toxicity cannot be defined.

Current Production and Use

Union Oil reported that L-11 syncrude is a residual obtained after distillation away of materials with boiling points of 680° F or less, and that L-6 is a full range, dewaxed syncrude.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

In general, crude shale oils are obtained from oil shale by destructive distillation followed by hydrotreating. The company did not provide any information on the current or planned production volumes of L-11 or L-6. A review of the production range (includes importation volumes) statistics for shale oils having the CAS No. 68308-34-9 (which is listed in the initial TSCA Inventory), has shown that between 11 million and 61 million pounds were reported as produced/imported in 1977. **/

Comments/Recommendations

The Agency has prepared status reports for a number of TSCA Section 8(e) submissions received on synthetic and petroleum fuels: 8EHQ-0029, 0030, 0044, 0082, 0083, 0117, 0148, 0212, 0215, 0216, 0217, 0238, 0240, 0247, 0252, 0253, 0297, 0301, 0306, 0316, 0323, 0377, 0389, and 0398. (These numbers represent the last four digits of the EPA Document Control numbers).

a) In view of the EPA's general interest in company actions which are taken on a voluntary basis in response to chemical toxicity/exposure information, the Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Union Oil Company of California to describe its actions to warn workers and others, and to reduce and/or eliminate exposure to L-11 and L-6 syncrude shale oils. The company will also be asked if it is conducting, or plans to conduct, additional studies to further define the toxicity of the subject shale oils.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to DOE, OSHA, NIOSH, OW/EPA, OSWER/EPA, OANR/EPA, ORD/EPA, the EPA Alternate Fuels Workgroup, and the OTS Synfuels Workgroup. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: NOV 5 1981

SUBJECT: Status Report* 8EHQ-1081-0418

Approved 11/9/81

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The CIBA-GEIGY Corporation has provided a summary of recently obtained final results from an in vitro BALB/3T3 mouse cell transformation assay and an in vivo Chinese hamster bone marrow cytogenetics assay of XU-238 (5-ethyl-5-methyl-1,3-bis-(oxiranylmethyl)-2,4-imidazolidinedione; CAS No. 15336-82-0). According to the company, a significant dose-dependent trend in transformation frequency with a highly significant difference between the control and the highest dose tested was observed in the mouse cell transformation assay. With regard to the hamster bone marrow cytogenetics assay, CIBA-GEIGY reported that a significant difference in chromosomal aberration frequency was observed between the control animals and the animals receiving the highest oral dose (2500 mg/kg) of XU-238. The company also reported that other previously performed mutagenicity tests, with the exception of the in vitro mouse lymphoma assay, had given results which were either negative or equivocal. In addition, CIBA-GEIGY reported that previous acute animal studies show that XU-238 is a severe skin and eye irritant.

CIBA-GEIGY stated that the relevance of the in vitro cell transformation assay "in assessing human hazard is unknown." The company also stated that this particular assay "is currently being evaluated in EPA's Gene Tox program to determine its correlation with in vivo assays and, to date, it has been concluded that the data base is so small that further validation of the system is necessary." In addition, the company stated that the other limitations of the assay "include the facts that (a) the target cells utilized are from an established line and therefore are not equivalent to normal cells; and (b) that the spontaneous background rate is susceptible to change unless carefully controlled." With regard to the in vivo cytogenetics assay, CIBA-GEIGY stated that the human significance of the obtained positive results is doubtful because the experimental conditions (i.e. high dose via an oral route) are "totally irrelevant to human exposure."

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

5-Ethyl-5-methyl-1,3-bis(oxiranylmethyl)-2,4-imidazolidinedione (XU-238) has a very high degree of structural similarity (i.e. an additional -CH_2- group) to 5,5-dimethyl-1,3-bis(oxiranylmethyl)-2,4-imidazolidinedione, the major component of the epoxy material, XB-2793. The potent irritant properties of XB-2793 have been reported previously in two separate TSCA Section 8(e) notices (8EHQ-0180-0328 et seq., CIBA-GEIGY Corporation; and 8EHQ-0481-0397 et seq., Wilmington Chemical Corporation) which have been evaluated by the Agency. In addition to causing severe irritation, XB-2793 was reported in those submissions to be oncogenic, in that the material produced benign and malignant skin tumors (including some with distant metastases) in mice chronically treated via dermal application. Submission 8EHQ-0180-0328 also reported that XB-2793 in both the presence and absence of exogenous metabolic activation demonstrated in vitro mutagenicity in almost all Ames (Salmonella typhimurium (bacteria)) assays and in a mouse lymphoma cell forward mutation assay. In the present submission, CIBA-GEIGY stated that with the exception of the mouse lymphoma assay, all tests other than the cultured cell transformation and cytogenetics assays have been negative or equivocal for XU-238. However, an attachment to the present submission indicates that two Ames assays of XU-238 were positive. Considering all of the above toxicologic findings and XU-238's structural similarity to 5,5-dimethyl-1,3-bis(oxiranylmethyl)-2,4-imidazolidinedione, it is not at all surprising that XU-238 can cause severe skin and eye irritation and also displays mutagenic activity. One major question which remains to be answered, however, is whether XU-238 is an oncogen.

In its submission, the CIBA-GEIGY Corporation made several statements which the Agency believes should be addressed. The submitter's comment that the Gene-Tox Program has concluded that the Balb/c 3T3 data base is so small that further system validation is necessary is incorrect. The Gene-Tox Program has made no statement about either the size of the Balb/c 3T3 data base or the need for further validation. This assay, along with several other assays for cellular transformation, is currently being evaluated by the Gene-Tox Program. Any statement about its place in a screening program or need for further test system development/validation must await the outcome of the evaluation which will specifically address these issues. Apart from this however, it should be pointed out that, in spite of the limitations noted by the submitter, transformation assays are generally regarded to be good predictors of in vivo activity when the results are positive. The difficulty with these assays is the proportion of false negatives detected because of the insensitivity of the cell line(s) used in the assay, the lack of adequate metabolic activation systems, poor experimental design and/or technical difficulties associated with proper growth and cell maintenance. It should also be noted that, strictly speaking, positive results in the in vitro portion of a cell transformation assay (morphological transformation) should be confirmed by growth of the transformed cells in soft agar or by inoculation into syngeneic or congenitally athymic animals. However, because morphologic transformation is generally regarded as being predictive of potential _in vivo_ oncogenic activity and because of technical difficulties associated with growing cells in soft agar and the cost of animal inoculation, these confirmatory steps are sometimes omitted from a cell transformation assay. In these instances, morphologic transformation alone, because of its demonstrated correlation with _in vivo_ oncogenicity, is used as a criterion for positive results and should be viewed as reason for concern for the potential _in vivo_ activity of the test agent.

With regard to the _in vivo_ cytogenetics assay, the submitter stated that positive results were observed following oral administration and that this route bears no relationship to the route of human exposure. One assumes, although it is not stated, that the route of human exposure to XU-238 is by inhalation or dermal contact. It is a well known toxicologic phenomenon that inhaled material(s) may be expired from the respiratory tract to the oral cavity where it is swallowed and then subject to absorption from the gastrointestinal tract. Therefore, positive results observed following oral administration can be relevant when the expected route of human exposure is via inhalation.

In general, the EPA believes that _in vitro_ studies in themselves do provide valuable data that can aid in assessing the possible risks posed by chemicals to health and the environment. The Agency also believes that positive _in vitro_ test results in combination with additional information, including knowledge of exposure to or high production of the chemical substance or mixture, would in many cases suggest the need for further, more definitive toxicologic study. The results obtained from such additional testing should also be reviewed and considered for possible submission to the EPA pursuant to Section 8(e) of TSCA.

Current Production and Use

A review of the production range (includes importation volumes) statistics for 5-ethyl-5-methyl-1,3-bis(oxiranylmethyl)-2,4-imidazolidinedione (CAS No. 15336-82-0), which is listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and/or importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a)). The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

CIBA-GEIGY reported that XU-238 is a partially water-soluble, low viscosity liquid intended primarily for use as a component of adhesion systems/formulations. No other use information was located in the secondary literature sources consulted.

Comments/Recommendations

The CIBA-GEIGY Corporation provided a copy of its current XU-238 label and Material Safety Data Sheet containing recommended handling precautions. The submitter also provided a copy of a letter notifying its customers and those companies which have been supplied samples of XU-238 of the product's toxicity. In addition, the company stated that the reported mutagenicity results were obtained on XU-238 which was manufactured abroad, and has been imported for the past few years. CIBA-GEIGY also stated that it does not have any analytical results on the diglycidyl ether or epichlorohydrin content of the tested XU-238. However, because the company has reportedly begun manufacture of XU-238 domestically, the company stated that it plans to re-evaluate the mutagenicity potential of a representative sample of U.S. manufactured XU-238 of known diglycidyl ether and epichlorohydrin contents.

The National Institute for Occupational Safety and Health (NIOSH) has prepared a "Criteria Document" on Glycidyl Ethers (DHEW (NIOSH) Publication No. 78-166; June 1978). The Chemical Hazard Identification Branch (CHIB/AD/EPA) has been considering the preparation of Chemical Hazard Information Profiles (CHIPs) on 5,5-dimethyl-1,3-bis(oxiranylmethyl)-2,4-imidazolidinedione and several other epoxy compounds. The Test Rules Development Branch (TRDB/AD/EPA) is currently reviewing information pertaining to "Glycidol and its Derivatives" as recommended by the Interagency Testing Committee (ITC).

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the CIBA-GEIGY Corporation to provide complete copies of the final reports, including protocols and data, from all of the in vitro and in vivo studies of XU-238 which were cited in the submission. In addition, CHIB will request the CIBA-GEIGY Corporation to provide, when available, complete copies of the final reports from the planned studies designed to re-evaluate the mutagenic activity of XU-238. The company will also be asked if it is conducting, or plans to conduct, an in vivo study designed to determine the oncogenic potential XU-238.

b) The Chemical Hazard Identification Branch will screen the requested toxicologic information and consider the need for further assessment of 5-ethyl-5-methyl-1,3-bis(oxiranylmethyl)-2,4-imidazolidinedione (XU-238).

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, OW/EPA, OSWER/EPA, ORD/EPA and TRDB/AD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1081-0419
Page 1 of 3

DATE: NOV 9 1981

SUBJECT: Status Report* 8EHQ-1081-0419

Approved 11/9

Revision Needed ____________

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

Exxon Chemical Americas has provided the following summarized results from a recently completed 9-day inhalation study of methylcyclopentadiene dimer (MCPD; CAS No. 26472-00-4) in male and female rats and mice:

> "Male and female rats and mice were exposed to MCPD at 5, 50, and 404 ppm for six hours a day over a two-week period (9 exposure days). Kidney effects, evidenced by epithelial cells and casts in the urine along with protein accumulation and hyperplasia of the tubular epithelial cells, were observed only in male rats at all exposure levels. These lesions were not found in female rats nor in male or female mice. Hepatic mitotic figures were increased in male rats at all exposure levels and in male mice exposed to 50 and 404 ppm. All high dose (404 ppm) animals of both species and intermediate dose (50 ppm) male mice had increased liver weights. All animals with low exposure (5 ppm) had organ weights comparable to controls."

Exxon Chemical Americas reported that the above study was performed because MCPD is structurally similar to dicyclopentadiene and the company's interest was to determine any similarity in the biological activity between the two compounds. The submitter stated that the observed kidney and liver toxicity for MCPD was similar to that previously reported under Section 8(e) by the company for dicyclopentadiene (8EHQ-0980-0364).

Submission Evaluation

Methylcyclopentadiene dimer (MCPD) does have a high degree of structural analogy (i.e. MCPD contains two additional $-CH_3$ substituents) to dicyclopentadiene. Dicyclopentadiene is highly reactive and is known to cause a variety of systemic toxicities, including kidney and liver toxicity. It is not unexpected, therefore, that methylcyclopentadiene dimer, which is also highly reactive, shows kidney and liver toxicity. The observed sex difference in MCPD toxicity is not surprising because dicyclopentadiene and many other organic compounds (e.g. carbon tetrachloride) can display varying degrees of sex-specific toxicity.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

A review of the production range (includes importation volumes) statistics for methylcyclopentadiene dimer (CAS No. 26472-00-4), which is listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s)/importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a)). **/

Exxon Chemical Americas reported that methylcyclopentadiene dimer is a cyclic diolefin which has limited uses as an intermediate in the production of both high energy fuels and fuel additives. According to secondary literature sources, however, MCPD can also be used in manufacturing curing agents, plasticizers, resins, surface-coatings, pharmaceuticals, and dyes.

Comments/Recommendations

Although Exxon Chemical Americas stated that the company has not had an opportunity to fully evaluate the possible human health implications of the observed toxic effects of MCPD in terms of the current industrial hygiene/medical surveillance practices, the company did state that "relevant information is being compiled for a multidisciplinary review during which any need for modification of current practices will be considered." Exxon Chemical Americas also reported that the company has notified its employees and DCPD and MCPD customers and co-producers about the information contained in the Section 8(e) submission and has urged continued adherence to the industrial hygiene practices described in the current MCPD Material Safety Data Sheet.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request Exxon Chemical Americas to provide a full copy of the final report, including test protocols and data, from the 9-day MCPD inhalation study cited in its submission. In view of the Agency's general interest in company actions which are taken on a voluntary basis in response to chemical toxicity/exposure information, CHIB will ask Exxon Chemical Americas if it is conducting, or plans to conduct, other studies designed to further define the toxicity of MCPD.

**/ The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 719).

b) The Chemical Hazard Identification Branch will screen the requested toxicity information and consider the need for further assessment of MCPD.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, DOE, FDA, OW/EPA, OSWER/EPA, ORD/EPA, and OANR/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1281-0420
Page 1 of 2

DATE: DEC 14 1981

SUBJECT: Status Report* 8EHQ-1281-0420

Approved 1/6/82

Revision Needed

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

Exxon Chemical Americas reported that dibromochloromethylpropane (DBCMP) was detected in concentrations ranging from 50 to 100 ppm in Exxon Bromobutyl 2244, a brominated butyl rubber (CAS No. 68441-14-5). The submitter stated that although no toxicity data were found for DBCMP, the compound is structurally similar to dibromochloropropane (DBCP; CAS No. 96-12-8). In light of the similarity, the company decided to treat DBCMP as it treats DBCP by observing the OSHA established exposure limit of 1 ppb on an 8 hour time-weighted average (TWA).

According to Exxon Chemical Americas, DBCMP is physically entrapped in the rubber and exposure could only occur from the release of DBCMP into air during high temperature processing operations in rubber goods plants. In addition, the submitter stated that mixing operations have been carried out in an attempt to simulate actual rubber plant operations. The company stated that although the simulated conditions cannot be considered as truly identical to those in the plant, DBCMP levels were found to range from non-detectable to 1 ppb.

Submission Evaluation

Although the submission does not contain the actual chemical structure of DBCMP, the company's actions, which were taken in the absence of specific toxicity data for DBCMP and were apparently based solely on a possible structure-activity comparison to DBCP, should be viewed as sound. Based on a general structure-activity relationship, it may be reasonable to assume that DBCMP would be capable of causing irritation and possibly kidney and liver toxicity. However, without specific toxicity data for DBCMP, it can only be speculated at the present time that DBCMP would produce the same toxic effects as DBCP, a compound which is capable of causing adverse human reproductive effects (aspermatogenesis in males) and oncogenic effects (mice and rats).

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

A review of the production range (includes importation volumes) statistics for brominated butyl rubber (CAS No. 68441-14-5), which is listed in the initial TSCA Inventory, has shown that between 13 million and 80 million pounds were reported as produced/imported in 1977.**/

According to the submitter, Bromobutyl 2244 is an imported "low unsaturation copolymer of isobutylene and isoprene brominated to change its curing activity for increased compatibility with highly unsaturated elastomers." No other use information was located in the secondary literature sources consulted.

Comments/Recommendations

Based on information obtained from its simulated rubber plant mixing operations, Exxon Chemical Americas believes that the potential risk of adverse human health effects from exposure to DBCMP is minimal. However, the company reported that its customers have been notified and advised to 1) monitor their plant operations; 2) insure adequate ventilation; and 3) observe a 1 ppb exposure limit. In addition, Exxon Chemical Americas reported that the considerble efforts undertaken to identify the source of DBCP in manufacturing processes have been successful and that corrective actions are planned which should eliminate DBCMP in future runs.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request Exxon Chemical Americas to provide the exact chemical structure and CAS Registry Number (if known) for dibromochloromethylpropane (DBCMP). In addition, the submitter will be asked to provide information relating to the source(s) of DBCMP in its brominated butyl rubber product.

b) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, OW/EPA, OSWER/EPA, ORD/EPA, and OANR/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1281-0421 S
Page 1 of 3

DATE: DEC 11 1981

JECT: Status Report* 8EHQ-1281-0421 S

Approved 1/6/82

Revision Needed

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The submitter (company name claimed as TSCA Confidential Business Information (CBI)) reported that oral administration of p-tert-butyltoluene (CAS No. 98-51-1) and p-tert-butyl benzaldehyde (CAS No. 939-97-9) to rats resulted in a decrease in testis weights and injury to the seminiferous epithelium. The submitter stated that the p-tert-butyltoluene and the p-tert-butyl benzaldehyde were administered once per day for five consecutive days at doses of 200 mg/kg and 100 mg/kg, respectively.

According to the submitter, both chemicals are manufactured on site and are used exclusively as intermediates in the production of a final product (product identity claimed as TSCA CBI). In addition, the submitter stated that p-tert-butyl benzaldehyde is sold to one other manufacturer for use as an intermediate. With regard to exposure, the submitting company reported that less than 200 ppm of p-tert-butyltoluene and p-tert-butylbenzaldehyde are present in its products and that the only other exposure to the chemicals would be during their manufacture. However, the submitter stated that there were not any steps in the company's manufacturing processes which require direct dermal contact with these chemicals. The company also reported that preliminary atmospheric measurements at its manufacturing site indicate exposure levels of less than 1 ppm to 3 ppm.

Submission Evaluation

Although p-tertbutylbenzaldehyde and p-tert-butyltoluene are reported to cause adverse testicular effects in rats via oral administration, the submitted information does not permit a distinction to be made between adrenal, pituitary, or direct effects on the testes. In addition, it should be noted that p-tert-butylbenzoic acid (p-TBBA), a likely metabolite of both p-tert-butyltoluene and p-tert-butylbenzaldehyde, is known to cause testicular atrophy and adverse seminiferous tubule effects in rats following oral administration.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

A review of the production range (includes importation volumes) statistics for p-tert-butyltoluene (CAS No. 98-51-1), which is listed in the initial TSCA Inventory, has shown that between 2 million and 20 million pounds of this chemical were reported as produced/imported in 1977. **/

A review of the production range (includes importation volumes) statistics for p-tert-butylbenzaldehyde (CAS No. 939-97-9), which is listed in the initial TSCA Inventory, has shown that between 200 thousand and 2 million pounds of this chemical were reported as produced/imported in 1977. **/

As noted previously, the submitting company has claimed its end-use for the above compounds as TSCA CBI. According to secondary literature sources, p-tert-butyltoluene is a stable, highly pure, high-boiling solvent which can be used in resin production and as an intermediate in certain organic syntheses. With regard to p-tert-butylbenzaldehyde, no use information other than that claimed as TSCA CBI by the submitter was located in the secondary literature sources consulted.

Comments/Recommendations

The submitting company reported that its p-tert-butylbenzaldehyde customer was being advised of the information contained in the TSCA Section 8(e) notice. In addition, the company reported that it plans to: 1) continue its toxicity test program to determine the toxicologic hazard of p-tert-butyltoluene and p-tert-butylbenzaldehyde; 2) re-examine operational procedures to ensure against any direct exposure of the workers to the chemicals; 3) continue its environmental monitoring program; and 4) examine available employee records for any significant incidence of related health problems.

a) The Chemical Hazard Indentification Branch (CHIB/AD/EPA) will request the submitting company to provide a complete copy of the final results, including test protocols and data, from the cited toxicity study. In view of EPA's general interest in voluntary company actions taken in response to chemical toxicity/exposure information, CHIB will ask the submitting company if its own workers have been advised of the submitted toxicity information.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

b) The Chemical Hazard Identification Branch will consider the preparation of Chemical Hazard Information Profiles (CHIPs) on both p-tert-butylbenzaldehyde and p-tert-butyltoluene. The Chemical Hazard Identification Branch is currently considering the preparation of a CHIP on p-tert-butylbenzoic acid (p-TBBA).

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, OW/EPA, OSWER/EPA, ORD/EPA, and OANR/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: JAN 22 1982

SUBJECT: Status Report* 8EHQ-1281-0422

Approved 1/22/82

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Atlantic Richfield Company submitted summarized preliminary histopathologic findings from an American Petroleum Institute (API)-sponsored chronic inhalation study of unleaded gasoline (CAS No. 8006-61-9) in rats and mice. The submitter reported that the study involved 800 F344 rats and 800 B6C3F1 mice (equal numbers per sex) exposed to unleaded gasoline at dose levels of 0, 67, 292, or 2056 ppm for 6 hours per day, 5 days per week for approximately 2 years. According to the information submitted by the Atlantic Richfield Company and additional histopathologic findings provided by the American Petroleum Institute on a "For Your Information" basis (FYI-AX-1181-0148 et seq.), significant neoplastic lesions were not observed in control animals, exposed mice of either sex, or in exposed female rats. However, the histopathology performed on exposed male rats which had died between the 18th and 24th months and those sacrificed at the end of the 24th month was reported to indicate an increased incidence of renal tubular epithelial neoplasms.

Submission Evaluation

Although the provided histopathological data leave no doubt that the tested unleaded motor fuel is carcinogenic toward the kidney of F344 rats, there is, however, considerable difference in sex-dependent susceptibility, in that male rats were much more prone to tumor induction than females.

Spontaneously occurring tumors of the renal tubular epithelium are quite rare in aging F344 rats. The spontaneous tumor incidence in the F344 strain ranges from 0.05 to 0.11% in males and from 0 to 0.05% in females. The spontaneous incidence of mixed histological types of malignant tumors of the kidney in F344 rats is of a similar order (i.e., up to 0.17% in males and 0% in females).

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

The tumor incidences elicted by inhalatory administration of the unleaded motor fuel should be considered against this very low background of spontaneous tumor incidence. The results of two histopathological examinations clearly indicate not only that the tested unleaded motor fuel induced renal carcinogenesis, but also that the tumor induction displayed an approximate dose-response relationship in the males rats.

Current Production and Use

A review of the production range (includes importation volumes) statistics for unleaded (i.e., natural) gasoline (CAS No. 8006-61-9), which is listed in the initial TSCA Inventory, has shown that over 16 billion pounds were reported as produced/imported in 1977. **/

The Atlantic Richfield Company reported that based on information obtained from API, the tested gasoline "was specially blended to meet EPA reference fuel specifications for unleaded gasoline." In addition, Atlantic Richfield reported that the tested blend also "meets typical characteristics of commercial gasoline in the DuPont Road Octane Survey of 1976."

Comments/Recommendations

The Atlantic Richfield Company reported its intention to request the American Petroleum Institute to "pursue these preliminary findings with in-depth statistical analyses, quality assurance and a scientific assessment of these specific findings in light of other results in the study." Atlantic Richfield also stated that when a final evaluation of the data obtained from the study has been completed, that evaluation, as well as the final report, will be provided to EPA.

EPA has received/evaluated the following Section 8(e) submissions on synthetic and petroleum fuels: (8EHQ) 0029, 0030, 0044, 0082, 0083, 0117, 0148, 0212, 0215, 0216, 0217, 0238, 0240, 0247, 0252, 0253, 0297, 0301, 0306, 0316, 0323, 0377, 0389, 0398, and 0417. (Note: These numbers are the last four digits of the Section 8(e) Document Control Numbers). EPA has also received/screened a number of "For Your Information (FYI)" submissions on gasoline and other petroleum and synthetic fuels. The Document Control Numbers for FYI submissions which specifically involve gasoline are FYI-AX-1081-0138, FYI-AX-1081-0143, and FYI-AX-1181-0148.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

a) In view of the Agency's general interest in company actions which are taken on a voluntary basis in response to chemical toxicity/exposure information, the Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Atlantic Richfield Company to describe the actions it has taken in response to the submitted information on unleaded gasoline to warn workers and others, and to reduce and/or eliminate exposure.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, DOE, OW/EPA, OSWER/EPA, ORD/EPA, OANR/EPA, and to the EPA's Alternate Fuels Workgroup. CHIB will also provide a copy of the status report to the Office of Toxics Integration (OTI/OPTS/EPA) and the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1281-0423
Page 1 of 3

DATE: JAN 5 1982

SUBJECT: Status Report* 8EHQ-1281-0423

Approved 1/6/82

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Union Carbide Corporation provided summary results from a chronic mouse dermal application study of two types of carbon fibers. According to the submitter, the carbon fibers were pulverized and suspended in benzene and applied via an automatic pipette to the clipped backs of mice (40 animals per group) three times per week over the course of the chronic study. Benzene (negative control) and 3-methylcholanthrene (MC; positive control) were reportedly applied to groups of 40 mice according to the same schedule. Union Carbide stated that at the conclusion of the study, histologically verified tumors were found (see TABLE I. below) at the application site in three mice treated with Type P (High modulus Thornel Type P) carbon fiber suspension and three mice treated with MAT (Thornel MAT) carbon fiber suspension.

TABLE I.

GROUP	HISTOLOGICAL FINDINGS
Type P	- skin, papilloma (1) - skin, squamous cell carcinoma (1) - subcutis, hemangiosarcoma (1)
MAT	- skin, fibrosarcoma (1) - subcutis, squamous cell carcinoma (1) - subcutis, hemangiosarcoma (1)
Benzene	- None
MC	- papillomas (3) - carcinomas (33)

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Union Carbide reported that the mortality pattern for the carbon fiber-treated mice was similar to that for the benzene (control) group. The company also reported that the initial appearance (visual detection) of tumors was 9-10 months and 19-20 months for Type P and MAT carbon fiber-treated groups, respectively. The first tumor in the positive control (MC) group was reported to have appeared in the second month of the study.

Union Carbide stated that at the present time the company is "unable to attribute the observed results strictly to the fibers themselves, or to possible contaminants thereon, or to artifacts introduced during preparation and transmission of the sample, to experimental procedures, or other possible causes of the observed biological effect." Union Carbide also stated that the company "has no knowledge of any significant effects to people, chronic or otherwise, arising from several years of manufacture, processing and marketing products of this kind, other than skin irritation."

Submission Evaluation

Although it is conceivable that the carbon fibers themselves could be carcinogenic based on actual or pseudo polycyclic structure, the submitter should be requested to provide the identity of the actual chemical source(s) of the tested carbon fibers and a description of process(es) used in the manufacture of those fibers.

Current Production and Use

Union Carbide reported that carbon fibers are "essentially 100% carbon in a fibrous form suitable for industrial processing into articles and materials in which the carbon is not chemically altered." According to secondary literature sources, Thornel® is a tradename for graphite yarns. In addition, Thornel® was reported for the initial TSCA Inventory (1977) as graphite (CAS No. 7782-42-5). Although some secondary literature sources point out that the only fibers that should be called graphite are those which are processed from coal tars or pitches, other secondary literature sources report that high tensile-strength graphite fibers can also be made from rayon or polyacrylonitrile.

Comments/Recommendations

The Union Carbide Corporation stated that its employees and customers were being advised of the submitted information on carbon fibers. In addition, Union Carbide stated that the final report, which is expected to be issued in April, 1982, will be provided to EPA as a supplement to the initial Section 8(e) submission. The submitting company also reported that the EPA would be advised of additional results from the subject chronic mouse skin-painting study of carbon fibers, as well as the results from further toxicologic and analytical studies which are currently being considered.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Union Carbide Corporation to provide the identity of the actual chemical source(s) of the tested carbon fibers and a description of the process(es) used in the manufacture of those fibers.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, OW/EPA, OSWER/EPA, OANR/EPA, and ORD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1281-0424
Page 1 of 3

DATE: JAN 15 1982

SUBJECT: Status Report* 8EHQ-1281-0424

Approved 1/19/82

Revision
Needed __________

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Velsicol Chemical Corporation submitted the following prepublication abstract from a manuscript containing toxicologic results which are reported to "suggest" that both 3,3',4,4'-tetrachloroazobenzene (TCAB; CAS No. 14047-09-7) and 3,3',4,4'-tetrachloroazoxybenzene (TCAOB; CAS No. 21232-47-3) are teratogenic in the chick embryo:

> "Abstract. The toxicity of 3,3',4,4'-tetrachloroazobenzene (TCAB) and 3,3',4,4'-tetrachloroazoxybenzene (TCAOB) to chick embryos was examined. TCAB or TCAOB (0.1 ng to 100 ng per egg) was dissolved in corn oil and injected into the air cell of fertile chicken eggs. The time of injection had a major effect on embryo mortality as eggs injected with TCAB or TCAOB on the fourth day of incubation had a higher incidence of embryo mortality than eggs injected on days 11-13. Both TCAB and TCAOB were more toxic than all other chemicals that have been tested in the chick embryo with the exception of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). Comparing the potency of the two compounds, TCAOB was more potent than TCAB in the chick embryo with an estimated LD_{50} of 12 ng and 44 ng respectively. Rump edema was the major abnormality observed in embryos treated with either TCAB or TCAOB. Other malformations included altered feather pattern and lack of down, hemorrhage, external viscera, reduced body size, failure to withdraw the yolk sac, beak malformation, dilation of blood vessels and monomicropthalmia. The results of this investigation suggest that both TCAB and TCAOB are teratogenic in the chick embryo."

Velsicol stated that the author of the paper has requested that the paper (but not the results) be maintained as confidential until the paper is accepted for publication. Velsicol also stated that as soon as the company is notified of the acceptance, a complete copy of the paper will be submitted to EPA.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

(Note: The Velsicol Chemical Corporation previously submitted (8EHQ-0981-0409 et. seq.) two unpublished manuscripts which concerned 3,3',4,4'-tetrachloroazobenzene (TCAB; CAS No. 14047-09-7) and 3,3',4,4'-tetrachloroazoxybenzene (TCAOB; Cas No. 21232-47-3). The first paper provided a literature review of the toxic effects of TCAB and TCAOB and included information that the chloracnegenic and enzyme inducing potencies of TCAB and TCAOB are as great or greater than that of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD). The second paper provided an update and review of information on chloracne associated with exposure to TCAB and TCAOB. In its submission, Velsicol stated that "the similarities between [TCAB and TCAOB] and TCDD are principally in the area of chloracnegenic potential.")

Submission Evaluation

According to the information contained in the submitted abstract, both TCAB and TCAOB do appear to have some degree of teratogenic/embryotoxic activity when tested in the chick embryo. However, without complete copies of the test protocol and actual data obtained, it is not possible at the present time to fully evaluate the reported findings. It should be noted that in some cases, chemical substances which have demonstrated teratogenic/embryotoxic effects in the chick embryo have also displayed teratogenic/embryotoxic activity when tested in mammalian systems.

Current Production and Use

In TSCA Section 8(e) submission 8EHQ-0981-0409 et. seq., Velsicol reported that both TCAB and TCAOB are impurities in 3,4-dichloroaniline (CAS No. 95-76-1), the pesticide methazole and pesticide products that are formulated from 3,4-dichloroaniline (e.g., diuron, linuron, and propanil). According to secondary literature sources, 3,4-dichloroaniline is used both in the production of pesticides and as an intermediate in the manufacture of certain dyes. Diuron, linuron, propanil, and methazole are all registered pesticides. Because diuron and linuron are listed in the initial TSCA Inventory, however, the possibility exists that these particular compounds have uses other than as pesticides.

A review of the initial (1977) TSCA Inventory has shown that 3,3',4,4'-tetrachloroazobenzene (CAS No. 14047-09-7), 3,3',4,4'-tetrachloroazoxybenzene (CAS No. 21232-47-3), methazole (2-(3,4-dichlorophenyl)-4-methyl-1,2,4-oxadiazolidine-3,5-dione; CAS No. 20354-26-1), and propanil (N-(3,4-dichlorophenyl)propionamide; CAS No. 709-98-8) are not listed. **/

A review of the production range (includes importation volumes) statistics for 3,4-dichloroaniline (CAS No. 95-76-1), which is listed in the initial TSCA Inventory, has shown that between 100 thousand and 1 million pounds of this chemical were reported as produced/imported in 1977. **/

A review of the production range (includes importation volumes) statistics for diuron (N'-(3,4-dichloropehnyl)-N,N-dimethylurea; CAS No. 330-54-1), which is listed in the initial TSCA Inventory, has shown that between 100 thousand and 1 million pounds of this chemical were reported as produced/imported in 1977. **/

A review of the production range (includes importation volumes) statistics for linuron (N'-(3,4-dichlorophenyl)-N-methoxy-N-methylurea; CAS No. 330-55-2), which is listed in the initial TSCA Inventory has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and/or importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a)). **/

Comments/Recommendations

The Test Rules Development Branch (TRDB/AD/EPA) is currently reviewing chemical toxicity/exposure information on 3,4-dichloroaniline as it pertains to the category "Aniline and Chloro-, Bromo-, and/or Nitro- Anilines" which was recommended by the Interagency Testing Committee (ITC).

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Velsicol Chemical Corporation to describe the actions it has taken on a voluntary basis in response to the submitted information on TCAB and TCAOB, to warn workers and others, and to reduce and/or eliminate exposure to the subject chemicals. In addition, CHIB will ask the submitting company if it is conducting, or plans to conduct, toxicologic studies designed to assess potential mammalian reproductive hazards/risks associated with exposure to TCAB, TCAOB and/or materials which contain those substances.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, OANR/EPA, OW/EPA, OSWER/EPA, ORD/EPA, OPP/OPTS/EPA, TRDB/AD/EPA and the EPA Chlorinated Dioxins Workgroup. A copy of the status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: FEB 2 1982

SUBJECT: Status Report* 8EHQ-1281-0425 S

Approved 2/5/82

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

Note: The submitting company claimed its identity, the identity of the tested chemical, the CAS Registry Number and the product trade name as TSCA CBI (Confidential Business Information).

The submitting company provided the protocol and a summary of preliminary results from an ongoing 21-day skin-painting study designed to investigate the potential testicular toxicity of the subject chemical in male rats (Sprague-Dawley) and rabbits (New Zealand white SPF).

According to the submitted protocol, the chemical (diluted in U.S.P. mineral oil) was being applied daily for a total of 21 days at doses of 0.25, 0.10, and 0.05 ml/kg to the skin (clipped free of fur). In addition, the protocol indicated that the following parameters would be examined: body and testis weights, gross and histopathology for a number of organs (including the testes, seminal vesicles, prostate, epididymis), pharmacotoxic observations for skin and neurologic responses to treatment, blood chemistry (e.g., testosterone levels), urine analysis, and reversibility of observed effects.

With regard to the submitted preliminary results, the company reported that irritation was observed after the first day of dosing and that by the fourth day, rabbits receiving 0.25 and 0.10 ml/kg had developed severe skin irritation and 2 rabbits receiving 0.25 ml/kg had died. The submitter reported that the signs of the skin irritation included "edema, eschar, and induration." Due to the severity of the irritation, the submitter reported that dosing was terminated for rabbits receiving 0.25 and 0.10 ml/kg and that those animals were sacrificed. The submitter reported, however, that the study was still in progress with the rats (all doses) and the remaining rabbits (.05 ml/kg group).

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

The company stated its belief that its current safety precautions observed during both manufacturing and use of the tested material are sufficient for employee protection. The company also stated that it had previously examined its employees and "found no health effects that could be related to the manufacture or use of the product."

Submission Evaluation

Although the subject study was designed, for the most part, to determine if the submitter's product could cause testicular toxicity, no such finding was reported in, or can be inferred from, the provided information. The toxicologic findings which were reported were severe skin irritation in rabbits at the two highest doses and 2 deaths in the group of rabbits receiving the highest dose. The submission did not indicate whether skin irritation or lethality was observed in rats at any of the applied doses. A more complete evaluation of the 21-day dermal application study will be possible following EPA's receipt of the final report which should include the data obtained for all of the parameters specified in the provided protocol.

Current Production and Use

Due to the fact that the submitter has claimed the identity of the subject chemical as TSCA CBI, information concerning current production and use of the substance will not appear in this status report. The chemical is, however, listed in the initial TSCA Inventory.

Comments/Recommendations

The submitter reported that based on the new data, the Material Safety Data Sheet and safety precautions for the product have been revised and those revisions transmitted to all customers who have purchased the product from the submitter within the past year. The company also reported that a copy of the final results from the ongoing dermal application study would be provided to EPA.

In reporting acute in vivo toxicity results under Section 8(e), most companies consider such factors as the lethal dose, the route of administration, the occurrence of unexpected serious effects (which could also be obtained during necropsy, via "cage-side" observations, etc.), and/or the extent and pattern of the exposure to the subject chemical substance (e.g., the greater the acute toxicity, the less heavily companies weigh the tested chemical's exposure). With regard to the present submission, it is possible that such pertinent information was available to and/or considered by the company in submitting the summarized acute toxicity results to EPA pursuant to Section 8(e) of the Toxic Substances Control Act (TSCA; PL 94-469).

a) In order to determine the need for further, more in-depth assessment of the subject chemical substance, the Chemical Hazard Identification Branch (CHIB/AD/EPA) will screen the final results of the submitter's 21-day dermal application study.

b) The Chemical Hazard Identification Branch will bring this submission to the attention of both TRDB/AD/EPA and CCD/OTS/EPA.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1281-0426
Page 1 of 3

DATE: JAN 27 1982

SUBJECT: Status Report* 8EHQ-1281-0426

Approved 2/3/82

Revision Needed ____

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The CIBA-GEIGY Corporation submitted complete copies of final reports from a battery of short-term *in vitro* and *in vivo* mutagenicity screening studies of N-[4-(oxiranylmethoxy)phenyl]-N-(oxiranylmethyl)-oxiranemethanamine (CAS No. 5026-74-4). CIBA-GEIGY reported that positive results were obtained in each of the following studies: Chinese Hamster (bone marrow) Sister Chromatid Exchange Study, Chinese Hamster (bone marrow) Nucleus Anomaly Test (Somatic Interphase Nuclei), Mouse Lymphoma Cell Point Mutation Assay, and Ames *Salmonella* (bacteria) and *Saccharomyces D4* (yeast) Tests with and without metabolic activation. The submitter also reported that the tested compound, as with other epoxy resins, is capable of producing both skin irritation and sensitization.

The CIBA-GEIGY Corporation stated that the reported positive mutagenicity results "are of limited relevance to human risk since the most likely potential route of human exposure is dermal." The submitter also stated that the tested chemical is "a liquid with a vapor pressure of less than 0.1 mm Hg at 68°F." In addition, CIBA-GEIGY reported that its current labeling/handling precautions minimize the possibility of skin exposure to the tested substance and that the cured end products which are made from the substance are "highly cross-linked, inert and chemically resistant."

Submission Evaluation

As reported by CIBA-GEIGY, the subject compound did demonstrate mutagenic activity in each of the performed assays. In the *in vivo* studies, the compound (administered by gavage) did produce highly significant dose-related increases in Sister Chromatid Exchanges (SCE's) and interphase cell nucleus anomalies in the bone marrow of Chinese hamsters. In the *in vitro* Mouse Lymphoma Cell (L5178Y) assay, the subject chemical was weakly mutagenic in that there was an increase over control in the number of mutant colonies observed following an 18-hour incubation, but no detectable difference between treated and control following a 4-hour incubation. In the in vitro microbial assays, the compound did demonstrate mutagenic activity both in the presence and absence of exogenous metabolic activation in bacteria (Salmonella typhimurium strains TA-100 and TA-1535) and in yeast (Saccharomyces D4), indicating that the chemical does not require metabolic conversion in order to exert its mutagenic effect(s).

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

A review of the production range (includes importation volumes) statistics for N-[4-(oxiranylmethoxy)phenyl]-N-(oxiranylmethyl)-oxiranemethanamine (CAS No. 5026-74-4), which is listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s)/importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a)). **/

CIBA-GEIGY reported that the subject compound is a highly reactive, low volatility liquid monomer used in certain adhesive and laminate formulations.

Comments/Recommendations

As a result of the submitted toxicologic findings, CIBA-GEIGY reported that its customers were being notified and that both the label and Material Safety Data Sheet for the subject compound were being modified "to more strongly emphasize proper handling precautions."

Although a positive short-term genetic toxicity test result, when considered alone, may not be sufficient to offer reasonable support for a conclusion of substantial risk, EPA believes that such studies do provide valuable data that can aid in assessing the possible risks posed by chemicals to health and the environment. The Agency also believes that a positive short-term genetic toxicity test result in combination with additional information, such as knowledge of exposure to or high production of the chemical substance or mixture, would in many cases suggest the need for further, more definitive toxicologic study. Should the results obtained from such studies meet the reporting criteria set forth in EPA's March 16, 1978, Section 8(e) policy statement ("Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk"; 43 FR 11110), appropriate information should be submitted to EPA pursuant to TSCA Section 8(e).

**/ The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

The National Institute for Occupational Safety and Health (NIOSH) has prepared a "Criteria Document" on Glycidyl Ethers (DHEW (NIOSH) Publication No. 78-166; June 1978). In addition, the Test Rules Development Branch (TRDB/AD/EPA) is currently reviewing information pertaining to "Glycidol and its Derivatives" as recommended by the Interagency Testing Committee (ITC).

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will screen the submitted information and consider the need for further assessment of N-[4-(oxiranylmethoxy)-phenyl]-N-(oxiranylmethyl)-oxiranemethanamine (CAS No. 5026-74-4).

b) Considering EPA's general interest in company actions which are taken on a voluntary basis in response to chemical toxicity/exposure information, the Chemical Hazard Identification Branch (CHIB/AD/EPA) will ask the CIBA-GEIGY Corporation if it is conducting, or plans to conduct, further studies designed to better define the toxicity of the subject chemical substance.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, OW/EPA, OSWER/EPA, ORD/EPA and TRDB/AD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: APR 8 1982

SUBJECT: Status Report* 8EHQ-0282-0427 S

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Approved FK- 4/13

Revision Needed ______

Submission Description

Note: The submitting company claimed its identity as TSCA CBI (Confidential Business Information).

The submitting company provided a final report, including test protocols and raw data, from a guinea pig maximization (sensitization) study of V-50 (2,2'-azobis(2-amidinopropane) dihydrochloride; CAS No. 2997-92-4). The submitter also provided an account of several medical investigations, including summarized results of human skin patch tests associating V-50 exposure to a skin rash problem identified in the workplace, as well as final reports (supplied to the submitter by the Japanese manufacturer of V-50) on the acute oral and dermal toxicity of V-50 to rats, the irritant effects of V-50 to rabbit skin and the results of Ames Salmonella (bacteria) tests with both V-50 and an unidentified decomposition product of V-50. The submitter pointed out that the data supplied by the manufacturer of V-50 gave no indication of the skin sensitization potential of the compound.

In addition to the toxicity information, the submitting company provided a letter from St. John's Hospital (London, England) which contains a recommendation that maximization tests of V-50 be conducted. This recommendation was based on human "patch test results [which] suggest with a high degree of probability that V-50 may be the cause of the recent outbreak of dermatitis in the plant."

The conclusion of the submitted guinea pig maximization study of V-50 was that "based on the results obtained, the test material, V-50, is considered a strong skin sensitizer in guinea pigs." The submitted report stated that the test material was administered to 15 male guinea pigs as a 50% w/w mixture in petrolatum for the topical induction and as a 25% w/w mixture in petrolatum for the challenge application. According to the submitted report, all surviving animals (13) in the test group exhibited a reaction to the test material at 24 and 48 hours following the challenge application. The submitted report also stated that two animals in the test group were found dead on day 11 of the study. According to the submitted report:

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

> "Hypoactivity and ataxia were seen in [one animal] for two days prior to death. No pharmacotoxic signs were observed in [the second animal] prior to death. No visible lesions were observed during the gross pathological examination. The deaths of these two animals are considered treatment related."

The report also stated that one surviving animal in the test group exhibited hypoactivity on day 14 of the study but appeared normal at all other observations.

With regard to the other submitted toxicological results, the reported acute median oral lethal dose (LD50) of V-50 to rats was 0.41 g/kg bodyweight; the acute median lethal dermal dose (LD50) of V-50 to rats was found to be greater than 5.9 g/kg bodyweight; and V-50 was considered to be "mildly irritating" to rabbit skin. In addition, the submitted Ames Salmonella report concluded that under the conditions of the study, both V-50 and its decomposition product (tested separately) were non-mutagenic to Salmonella strains TA-1535, TA-1537, TA-1538, TA-98 and TA-100 with and without exogenous metabolic activation.

Submission Evaluation

Based on positive patch test results among workers exposed to V-50 and positive results in guinea pig maximization tests, V-50 does appear to be a strong skin sensitizer. In addition to the positive skin reaction reported in guinea pigs, two of the fifteen animals in the V-50 treated group exhibited delayed ataxia and/or hypoactivity at nine to fourteen days following topical application and two (including one hypoactive animal) died. These findings suggest dermal absorption of V-50. In addition, there is a possibility that peripheral nerve, spinal cord, and/or brain injury occurred, despite the absence of visible lesions during gross pathological examination.

It should be pointed out that the effects of dermal sensitization are not limited to skin reactions. In contrast to simple skin irritation, sensitization involves immune mechanisms that can cause immediate or delayed systemic reactions, including adverse effects on the central nervous system.

With regard to the reported Ames test results, V-50 as well as its unidentified decomposition product appear to be nonmutagenic to Salmonella typhimurium. However, there are questions with respect to test performance and data presentation which qualify this conclusion. There was no indication in the report that a cytotoxicity assay was performed to provide a rationale for dose selection. If the test chemicals are nontoxic, they should have been tested in the Ames assay to the limits of solubility or to an upper limit of 5 mg/plate. Also, the report did not provide data on the numbers of revertants per plate, standard deviations from the mean number of revertants per plate, or the number of plates per dose.

Current Production and Use

A review of the production range (includes importation volumes) statistics for 2,2'-azobis(2-amidinopropane) dihydrochloride (CAS No. 2997-92-4), which is listed in the initial TSCA Inventory, has shown that between 2,000 and 20,000 pounds of this chemical were reported as produced/imported in 1977.**/

No information on use patterns of V-50 was found in the secondary literature sources consulted.

Comments/Recommendations

The submitting company stated that protective measures in the workplace have been instituted, including the use of respirators, rubber gloves, coveralls and eye protection. In addition, employees are reportedly instructed to wash their hands well after contact with V-50. According to the submitter, there have been no skin problems with new workers since the changes were instituted. The submitter also stated that there have been no reports of skin problems at two of its other plant locations where V-50 is used. In conclusion, the submitting company stated that it believes that V-50 can be handled without substantial risk when proper hygienic procedures and working conditions are utilized.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will screen 2,2'-azobis(2-amidinopropane) dihydrochloride and consider the need for further assessment.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, ORD/EPA, OW/EPA and OSWER/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 6

DATE: MAR 11 1982

SUBJECT: Status Report* 8EHQ-0282-0428; -0429; -0430; -0431; -0432; -0433; and -0436

Approved Th 3/24/82

Revision Needed

FROM: Justine L. Welch JLW Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

In seven separate submissions, the Buffalo Color Corporation reported summarized final results from acute toxicity studies (oral LD50 and/or 4-hour inhalation LC50 determinations) of seven different chemicals in rats.

In submission 8EHQ-0282-0428, the company reported that N,N-dimethylaniline (CAS No. 121-69-7) was tested in three separate 4-hour inhalation studies using three different geometric mean particle sizes, nominal (estimated) chamber concentrations, and time-weighted measured concentrations at the breathing zone. The reported lethalities for both male and female rats are summarized as follows:

Mean Particle Size (µm)	Nominal Concentration (mg/m^3)	Measured Concentration (mg/m^3)	Mortality/14 days Males	Mortality/14 days Females
4.8	5100	1900	2/5	0/5
5.2	4600	2000	2/5	2/5
5.8	4900	1000	0/5	0/5

In submission 8EHQ-0282-0429, the company reported that following a single 4-hour inhalation exposure to N-ethylaniline (CAS No. 103-69-5), the LC50 for rats (combined sexes) was determined to be between 2600 and 3800 mg/m^3 based on nominal (estimated) chamber input. When based on actual measured concentrations at the breathing zone, however, the LC50 for combined sexes was reported to be between 1130 and 1480 mg/m^3.

The company reported in submission 8EHQ-0282-0430 that the LC50 for rats (combined sexes) exposed via inhalation for 4-hours to N,N-diethylaniline (CAS No. 91-66-7) was 4300 mg/m^3 based on nominal chamber concentration. The LC50 for combined sexes was reported to be 1920 mg/m^3 when based on measured concentration at the breathing zone.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

In submission 8EHQ-0282-0431, the submitter provided the results of a 4-hour inhalation toxicity study and an oral (single dose) toxicity study of Nadic Methyl Anhydride (Tradename for 3A,4,7,7A-tetrahydromethyl-4,7-methanoisobenzofuran-1,3-dione; CAS No. 25134-21-8) in rats. According to the company, the oral LD50 for the compound was determined to be 914 mg/kg for males, 1006 mg/kg for females, and 958 mg/kg for the combined sexes. With regard to the 4-hour inhalation study, the submitter reported that at a nominal chamber concentration of 4900 mg/m^3 (750 mg/m^3 measured at the breathing zone), 5/5 female rats died by the 5th day and 3/5 male rats died by the 14th day of post-exposure observation. The company stated that the tested aerosol was comprised of 90% Nadic Methyl Anhydride/10% ethyl alcohol and had a geometric mean particle size of approximately 3.2 µm.

In submission 8EHQ-0282-0432, the Buffalo Color Corporation reported the final results of a 4-hour inhalation study of dodecenylsuccinic anhydride (CAS No. 25377-73-5) in rats. The submitter stated that at a nominal chamber concentration of 5300 mg/m^3 (time-weighted measured concentration of 1220 mg/m^3), 2/5 female rats died by the 2nd day post-exposure and 2/5 male rats died by the 5th day. The company also reported that no further deaths were observed by the 15th day post-exposure. In addition, the submitter reported that the administered aerosol consisted of 90% dodecenylsuccinic anhydride/10% ethyl alcohol and had a geometric mean particle size of 2.3 µm.

The Buffalo Color Corporation also reported (8EHQ-0282-0433) the results of an acute oral (single dose) toxicity study of succinic anhydride (CAS No. 108-30-5) in rats. According to the company, the observed LD50 was 2157 mg/kg for male rats, 1510 mg/kg for female rats, and 1795 mg/kg for the combined sexes.

Finally, the submitter reported (8EHQ-0282-0436) the final results of two acute oral (single dose) toxicity studies of C. I. Basic Violet 1 (CAS No. 8004-87-3) in rats. According to the company, the compound was tested as a 93% pure powder and as a 45% solution in 15% acetic acid. The submitter reported that the LD50's observed for the combined sexes were 413 mg/kg and 815 mg/kg for the powder and the solution, respectively.

In submitting the preceding acute *in vivo* toxicity data, the Buffalo Color Corporation stated its belief that the subject substances do not pose a significant hazard to health or the environment.

Submission Evaluation

N,N-Dimethylaniline is known to be toxic via both acute and chronic exposure. The compound can produce skin irritation, methemoglobinemia, anemia, and liver and possible kidney toxicity. The compound is used as a standard for determining N-oxygenation of aromatic amines; several tissues from a variety of species have been investigated thus far including human liver and kidney. Although N-ethylaniline and N,N-diethylaniline are probably less toxic than N,N-dimethylaniline, these compounds are expected to bring about similar pathologic changes.

The 4-hour inhalation exposure of rats to approximately 500 ppm Nadic Methyl Anhydride or approximately 600 ppm dodecenylsuccinic anhydride (both compounds in aerosol form) resulted in delayed lethality. It is suspected that animals exposed to Nadic Methyl Anhydride died from some type of pulmonary inflammation most likely due to hydrolysis of the anhydride to the parent dibasic acid. Dodecenylsuccinic anhydride could interact with and/or displace phospholipoprotein surfactants in the lung (thereby decreasing elasticity) and could also provoke a macrophage response in the lung. With regard to the reported succinic anhydride toxicity, the compound appears to be more toxic and more irritating than certain alkali metal or alkaline-earth metal succinates which have been administered in 10 gram doses to humans for laxative action.

The toxicity of C. I. Basic Violet 1 appears to be similar to that of other rosaniline dyes which have been used in medicine for at least 50 years and whose biological activities and toxicities are fairly well known. For example, gentian violet has been used on burned areas of the skin where the compound promotes the formation of a tough scab which is antiseptic and prevents the loss of body fluid. Gentian violet has also been administered (orally) to humans in order to treat various types of worms. The minimal oral lethal dose for gentian violet in rabbits is 22 mg/kg.

Current Production and Use

The following table contains approximate production/importation range information for the subject chemicals from the initial (1977) TSCA Inventory. (Note: This production/importation range information does not include any data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production/importation range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710)).

Chemical	CAS Number	Approx. Prod./Imp. Range
N,N-Dimethylaniline	121-69-7	$2.0\text{X}10^6$ to $2.0\text{X}10^7$ lbs.
N-Ethylaniline	103-69-5	$1.1\text{X}10^5$ to $1.1\text{X}10^6$ lbs.
N,N-Diethylaniline	91-66-7	$3.1\text{X}10^5$ to $3.1\text{X}10^6$ lbs.
3A,4,7,7A-Tetrahydromethyl-4,7-methanoisobenzofuran-1,3-dione	25134-21-8	$2.2\text{X}10^5$ to $2.2\text{X}10^6$ lbs.
Dodecenylsuccinic Anhydride	25377-73-5	$2.0\text{X}10^5$ to $2.0\text{X}10^6$ lbs.
Succinic Anhydride	108-30-5	$5.2\text{X}10^5$ to $5.2\text{X}10^6$ lbs.
C. I. Basic Violet 1	8004-87-3	$2.6\text{X}10^5$ to $2.6\text{X}10^6$ lbs.

According to secondary literature sources, N,N-dimethylaniline is used in the synthesis of dyes and dye intermediates, and in the manufacture of vanillin. The compound is also used as an acid-accepting stabilizer, as a solvent, and as a reagent. N,N-Diethylaniline is used in the manufacture of dyestuffs, in the synthesis of dyestuff and other intermediates, and in the manufacture of pharmaceuticals. N-Ethylaniline is used mainly as an intermediate in organic synthesis.

As reported in secondary literature, Nadic Methyl Anhydride is used as a curing agent for epoxy resins and as an intermediate in the synthesis of alkyd resins, polyesters, and plasticizers. The compound is also used in laminating (electrical) and filament-winding processes. Succinic anhydride is used in the manufacture of organic esters (and other chemicals) and pharmaceuticals. The compound is also used as a resin hardener. Dodecenylsuccinic anhydride is used in preparing resins (e.g. alkyd, epoxy), plasticizers, corrosion inhibitors, and wetting agents.

According to the secondary literature, C. I. Basic Violet 1 was used at one time as a disinfectant. One of the primary current uses of the colorant is as a biological stain in microscopy.

Comments/Recommendations

Based on an initial review and evaluation of the reported acute toxicity results, it does not appear that the provided data warranted submission to the Agency pursuant to Section 8(e) of the Toxic Substances Control Act (PL 94-469). The basis for EPA's initial position is as follows:

> The preface to Part V of the Agency's March 16, 1978, "Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" (43 FR 11110) states that "a substantial risk of injury to health or the environment is a risk of considerable concern because of (a) the seriousness of the effect... and (b) the fact or probability of its occurrence." With regard to the seriousness of the effect, Part V explains further that the Agency considers the health effects for which substantial risk information must be reported to include "any pattern of effects or evidence which reasonably supports the conclusion that the chemical substance or mixture can produce cancer, mutation, birth defects, or toxic effects resulting in death, or serious or prolonged incapacitation." The information respecting these effects can be obtained directly or inferred from designed studies (e.g., *in vivo* experiments and tests as described in Part VI of the policy statement). With regard to the "fact or probability of its occurrence" criterion, Part V also provides that certain health effects are so serious that relatively little weight should be given to the chemical's exposure in determining whether a risk is substantial.

The EPA's response to Comment 14 in Appendix B of the March 16, 1978, policy statement provides guidance with regard to the Section 8(e)-reportability of results obtained from routine acute in vivo range finding tests such LD50 or LC50 determinations, irritation tests, etc. In its response, EPA stated that it believes that "many routine tests are based on a knowledge of toxicity associated with a chemical..." The EPA's response also directs that unknown effects which occur and are observed and/or determined during acute in vivo range finding tests may have to be reported if those effects are serious and meet the reporting requirements set forth in Parts V and VI of the policy statement.

Thus, when evaluating acute in vivo toxicity results for possible submission to EPA under Section 8(e), EPA believes that companies should consider such factors as the lethal dose, the route of administration, the occurrence of unexpected serious effects (which could be observed during necropsy, via "cage-side" observations, etc.), and/or the extent and pattern of the exposure to the subject chemical substance. In addition, the greater the acute toxicity, the less heavily companies should weigh the tested chemical's exposure.

Based on the preceding discussion, it is EPA's preliminary determination that the acute LC50/LD50 data, as provided, did not warrant submission to the Agency pursuant to TSCA Section 8(e). In making this preliminary determination, however, it must be understood that EPA may not be aware of additional pertinent information (such as the factors previously mentioned) which may have been available to and/or considered by the company in reporting the toxicity data under Section 8(e).

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Buffalo Color Corporation to provide its rationale as to why the reported results offer reasonable support for a conclusion of substantial risk of injury to health or the environment as defined the EPA's March 16, 1978, Section 8(e) policy statement ("Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk"; 43 FR 11110).

b) Considering the Agency's general interest in corporate actions which are taken on a voluntary basis in response to chemical toxicity/exposure information, the Chemical Hazard Identification Branch will request the Buffalo Color Corporation to describe the actions it has taken, in light of the provided acute toxicity data, to warn workers and others, and to reduce and/or eliminate exposure to the chemical substances which were cited in the submissions.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, OW/EPA, OSWER/EPA, and ORD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0282-0434
Page 1 of 3

DATE: MAR 1 1982

SUBJECT: Status Report* 8EHQ-0282-0434

Approved 3/4.

Revision Needed

FROM: Justine L. Welch, JW Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Sun Chemical Corporation provided a summary of preliminary results from a Cosmetic, Toiletry and Fragrance Association (CTFA)-sponsored chronic feeding study of D&C Red No. 19 (Basic Violet 10; Rhodamine B; CAS No. 81-88-9) in mice and rats. The submitting company stated that it has learned that there was an "increased incidence of mice with hepatic neoplasms" and an "increased incidence of rats with thyroid tumors." The company also stated that CTFA has informed the U. S. Food and Drug Administration (FDA) of the preliminary findings and that a final report would be submitted by CTFA to FDA in early 1982.

The Sun Chemical Corporation stated that D&C Red No. 19 is a bluish red colorant provisionally listed by the FDA for use in drugs and cosmetics and that the CTFA has petitioned FDA for permanent listing of the substance as a color additive. The company also stated that FDA regulations "required CTFA to notify FDA immediately of any findings that indicate potential for D&C Red No. 19 to cause adverse effects. 21 C.F.R. §81.27(d)(4)."

The Sun Chemical Corporation reported that a maximum of 25 personnel (production and laboratory) are directly involved at the company's Staten Island, N.Y. plant in the "manufacture, filtration, drying, pulverizing, packaging, evaluation and analysis of D&C Red No. 19" for ultimate use by the cosmetic and toiletry industry in lipsticks, soaps, and other products. The Sun Chemical Corporation also reported that a maximum of 10 personnel (production and laboratory) are directly involved at the company's manufacturing plants in the handling and reaction of the colorant as Basic Violet 10 (Rhodamine B) which is used by the pigment industry in the manufacture of organic pigments.

In conclusion, the Sun Chemical Corporation stated that its Section 8(e) notice was filed based on "knowledge of preliminary results predicated upon incomplete studies..." The company also stated that, at the present time, "insufficient information exists to enable a determination to be made as to whether a "substantial risk" exists with D&C Red No. 19."

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

The published scientific literature indicates that D&C Red No. 19 is readily absorbed when administered via the oral route and is extensively biotransformed. The literature also indicates that the chemical is hepatotoxic and suggests that the compound may be carcinogenic. Of particular concern in the present submission is the reported increased incidence of thyroid tumors in rats. This finding suggests that the effect(s) of D&C Red No. 19 on the following parameters may deserve further attention:

1) Effect(s) on incorporation of iodine by the thyroid.
2) Effect(s) on thyroid hormone levels.
3) Effect(s) on thyrotropic hormone.
4) Effect(s) on the general histology of the thyroid.

The above effects would be expected to manifest themselves long before the development of thyroid tumors.

Current Production and Use

A review of the production range (includes importation volumes) statistics for D&C Red No. 19 (CAS No. 81-88- 9), which is listed in the initial TSCA Inventory, has shown that between 110 thousand and 1.1 million pounds of this chemical were reported as produced/imported in 1977. **/

In its submission, the Sun Chemical Corporation reported that 16,000 pounds of D&C Red No. 19 were produced in the U.S. in 1980 and also reported that 247,000 pounds of Basic Violet 10 were imported to the U.S. during 1980.

According to secondary literature sources, the subject colorant can be used to dye a wide variety of synthetic and natural fibers (e.g., wool, cotton, nylon), paper, feathers, leather, wax, wood, soap, ink, and lacquer. In addition, the color has uses in drugs and cosmetics (e.g., tablets, capsules, toothpaste, lipstick, rouge). The chemical has also been used as a "tracing agent" in water pollution studies and as an analytical reagent for detecting a variety of metals (e.g., gold, antimony, mercury).

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Comments/Recommendations

In 1978, the International Agency for Research on Cancer (IARC) evaluated the possible carcinogenic risk due to exposure to Rhodamine B (IARC Monograph; Vol. 16; January 1978). Based on the information available at that time, IARC stated that "Rhodamine B has been tested in mice and rats by subcutaneous injection and, in inadequate studies, by oral administration. It was carcinogenic in rats when injected subcutaneously, producing local sarcomas."

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Sun Chemical Corporation to describe the actions it has taken on a voluntary basis in reponse to the submitted chemical toxicity/exposure information to warn workers and others and to reduce and/or eliminate exposure to the subject colorant.

b) The U.S. Food and Drug Administration has been requested to provide EPA with a complete copy of the final report, including data and protocols, from the CTFA-sponsored chronic feeding study of D&C Red No. 19 in rats and mice.

c) The Chemical Hazard Identification Branch will consider the preparation of a Chemical Hazard Information Profile (CHIP) on the subject colorant.

d) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, NTP, NCI, OW/EPA, OSWER/EPA, and ORD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0282-0435
Page 1 of 3

DATE: MAR 19 1982

SUBJECT: Status Report* 8EHQ-0282-0435

Approved JM 3/24

Revision Needed

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The FMC Corporation reported preliminary results from an acute rabbit dermal application toxicity study of sodium sulfide (CAS No. 1313-82-2). The following summary of the observed experimental findings was submitted by the company:

> "A sample of sodium sulfide 60% flake was subjected to dermal toxicity testing at a single dose level of 340 mg/kg. The test was performed as specified in the FIFRA proposed guidelines (FR 43: 37356-37357). Briefly, moistened 60% sodium sulfide flakes on a gauze pad were placed in contact with the skin of 10 albino rabbits (5 males, 5 females). All animals appeared normal at 1 and 3 hours after dosing. At 6 hours, 7 out of 10 animals were dead. At 24 hours, 9 out of 10 animals were dead. The remaining animal is likely to survive the duration of the study. The material also causes skin corrosion. The above data indicate that this material has a dermal LD_{50} of less than 340 mg/kg."

The FMC Corporation reported that although the corrosive properties of sodium sulfide are well documented in the scientific literature, no references were located on lethality due to dermal application of sodium sulfide. In addition, the company reported that it does not know the actual mechanism for the observed lethality, but believes that it is "reasonable to conjecture that the skin of the rabbit is penetrated by the corrosive action of sodium sulfide permitting its entry into the blood stream... [where] the sodium sulfide can be hydrolyzed to hydrogen sulfide which is known to be highly toxic." The company also reported that the conditions of the test in rabbits are unlikely to be duplicated in humans, because sodium sulfide is corrosive and gives painful burns. The FMC Corporation stated that "a person would not willingly permit sodium sulfide to remain in contact with the skin but would take action to wash it off or otherwise remove it" and that "the rabbit under test conditions is physically restrained from such relief." In addition, the submitting company stated that it has "no reason to believe there is undue hazard to humans because of this observed test result."

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

Both alkali and alkaline-earth metal sulfides (e.g., K, Na, Ca) have been used to treat a variety of human skin diseases and have also been used as depilatories. These types of compounds are known to be irritating (sometimes severely) to the skin. When swallowed, the sulfides, in addition to their alkaline corrosive action in the gastrointestinal tract (mainly the esophagus and stomach), release hydrogen sulfide. In addition, it is known that human death has occurred following application (to the head) of permanent-wave solutions containing ammonium sulfide. Therefore, it is not totally surprising that lethality was observed in rabbits treated dermally with sodium sulfide. As the submitter stated, the corrosive action of sodium sulfide would permit absorption of the compound directly into the bloodstream where hydrogen sulfide would be released. It should also be noted that hydrogen sulfide itself can be absorbed through the skin. Therefore, some of the hydrogen sulfide released via hydrolysis beneath the gauze pad would also be absorbed at the site of application to the rabbits.

Current Production and Use

A review of the production range (includes importation volumes) statistics for sodium sulfide (CAS No. 1313-82-2), which is listed in the initial TSCA Inventory, has shown that approximately 2.5 million to 8.8 million pounds of this chemical were reported as produced/imported in 1977.**/

The FMC Corporation reported that its sodium sulfide, which is sold in the form of a 60% flake, contains the equivalent of approximately 3 molecules of water per molecule of sodium sulfide. According to the secondary literature sources consulted, sodium sulfide is used in the manufacture of various organic chemicals and sulfur dyes. The compound has also been reported for use as depilatory agent for leather, as a solvent for gold (from gold ores), and as a photographic and analytical reagent. Sodium sulfide has also been used in sheep dips, and in paper pulping, engraving, and lithography processes.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Comments/Recommendations

The FMC Corporation reported that the company's current sodium sulfide product labels warn that the chemical is corrosive, can cause severe skin burns, and is harmful if absorbed through the skin. The submitter also reported that those people handling sodium sulfide are "admonished to avoid skin contact and to wear gloves and protective clothing." The FMC Corporation stated that the company is now considering whether its current sodium sulfide product label "gives sufficient warning to users or whether it should be modified in light of this new [reported] information."

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the FMC Corporation to provide a complete copy of the final report, including protocols and data, from the acute toxicity study of sodium sulfide which was cited in its submission.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, OW/EPA, OSWER/EPA, and ORD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: MAR 11 1982

SUBJECT: Status Report 8EHQ-0282-0436

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Please refer to the status report prepared for 8EHQ-0282-0428

EPA FORM 1320-6 (REV. 3-76)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0282-0437
Page 1 of 3

DATE: MAR 25 1982

SUBJECT: Status Report* 8EHQ-0282-0437

Approved 3/31/82

Revision Needed ____________

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Lever Brothers Company (Incorporated) provided a copy of the protocol and final pathology report from an acute inhalation study of C. I. Direct Violet 9 (CAS No. 6227-14-1) in male and female rats. Five (5) male and 5 female rats were exposed to the dye powder via inhalation at a nominal (estimated) chamber concentration of 6.5 mg/l for a single 4-hour period followed by a 14-day observation period, sacrifice, and necropsy. Control animals (2 males and 2 females) were exposed to room air under the same test conditions as the treated animals.

According to the submitted pathology report, clonic convulsions were observed in 2 dye-exposed female rats and corneal lesions were observed in 6 dye-exposed rats (sex not given) during the test. At necropsy, 1/5 males and 3/5 females rats were reported to have had ocular lesions "primarily due to inflammation and/or edema of the corneal stroma." One eye of one of the affected female rats was reported to be "shrunken, and had retinal displacement and was generally inflamed (panophthalmitis)."

Although the pathology report stated that microscopic examination of kidney, lung, liver, cervical lymph node, and ovary tissue did not reveal any evidence of effects attributable to dye exposure, histomorphologic changes observed in the testes, epididymis, and brain were considered by the submitter's pathologist as suggestive of being treatment related. The testes of one of the treated rats were reported to have degeneration of the germinal epithelium. In addition, this particular animal was found to have abundant cellular debris from the seminiferous tubule epithelium in the ducts of the epididymis. Although the testes of the other 4 male rats were reported to be within normal limits, 3 of the 4 were reported to have cellular debris in the ducts of the epididymis. These findings were considered by the pathologist as being "suggestive of an earlier testicular lesion." The testes and epididymis from both control animals were reported to be normal.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

With regard to the "suggestive" findings in the brain, the cerebellum of 7/10 treated and 1/4 control rats was reported to contain subtle histomorphological alterations (i.e., multiple foci of separated nerve fibers and/or vacuolated glial cells) in the gray matter of the folia. The pathology report stated that "due to the subtle nature of these changes it was difficult to determine whether they were pathological alterations or possibly artifacts associated with processing."

In its submission, the Lever Brothers Company stated that the provided data "may suggest that this material [C. I. Direct Violet 9] may pose a substantial risk to human health under certain manufacturing or processing conditions." Although the company stated that "a degree of risk may be associated with worker safety upon repeated exposure to the raw material when supplied as a powder," the company noted that "there is no evidence [that] this material when formulated in a commercial household liquid product poses any health risk to the general public."

Worker exposure at the Lever Brothers' manufacturing facilities was reported to be minimal. The company stated that C. I. Direct Violet 9 is "formulated at a 0.000025% level in the final product in batch operations at two facilities." Lever Brothers estimated that "human exposure at these facilities is approximately 0.10 hours/worker/shift over a range of 60-90 days yearly." The company also reported that "handling of the dye by plant workers is clearly defined in a Material Safety Data Sheet minimizing exposure through inhalation."

Submission Evaluation

It is possble that an analog of p-phenylenediamine would be released from C. I. Direct Violet 9 in the body via the metabolic action of azoreductase. The p-phenylenediamine analog could cause an intense release of histamine and could also cause sensitization. With regard to the adverse ocular effects observed in the rats, it should be noted that p-phenylenediamine itself is known to have caused blindness in women who applied the compound to their eyelashes. It is not possible to determine the validity of the adverse effects noted in the cerebellar gray matter unless behavioral observations indicated motor dysfunction or Purkinje cell involvement. Likewise, the relationship between exposure to the dye and the observed adverse male reproductive system effects cannot be determined on the basis of the provided information.

Current Production and Use

A review of the production range (includes importation volumes) statistics for C. I. Direct Violet 9 (CAS No. 6227-14-1), which is listed in the initial TSCA Inventory, has shown that between 1 thousand and 10 thousand pounds of this chemical were reported as produced/imported in 1977. This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

According to secondary literature sources, C. I. Direct Violet 9 can be used to dye leather, paper, and natural and synthetic fibers (e.g., wool, silk, nylon). As previously stated, the submitter reported that C. I. Direct Violet 9 is formulated in a commerical household liquid product which was not identified in the submission.

Comments/Recommendations

The Lever Brothers Company stated that "due to the inconclusive results of the current animal inhalation study [the company] would normally consider conducting a follow-up "head only" inhalation study." However, because the submitting company has decided (based on marketing considerations) to discontinue its particular use of C. I. Direct Violet 9, no further testing of the dye is being considered. The Lever Brothers Company reported that the current handling procedures (outlined in a submitted Material Safety Data Sheet) would be strictly enforced during the phase-out period and that all "remaining dye at the plants will either be returned to the supplier or disposed of as a hazardous material." The Lever Brothers Company also stated that the supplier of C. I. Direct Violet 9 was being informed of this TSCA Section 8(e) notice.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will screen the submitted information on C. I. Direct Violet 9 in order to determine the need for any further assessment.

b) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will transmit copies of this status report to NIOSH, OSHA, CPSC, FDA, OW/EPA, OSWER/EPA, and ORD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTS/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0382-0438 S
Page 1 of 3

DATE: APR 6 1982

SUBJECT: Status Report* 8EHQ-0382-0438 S

Approved M. 4/7

Revision Needed ____________

FROM: Justine L. Welch, Team Leader JW
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The submitting company (name claimed as TSCA Confidential Business Information (CBI)) provided summarized results from several short-term *in vivo* inhalation toxicity studies of the particulate form of a partial aluminum potassium salt of polyacrylic acid in rats. The submitter also provided summarized results from several *in vitro* mammalian (mouse) macrophage studies of a partial aluminum potassium salt of polyacrylic acid (differing particle sizes), a partial sodium salt of polyacrylic acid, a partial sodium salt of an acrylic acid-starch graft polymer, and polyacrylic acid.

With regard to the provided *in vivo* inhalation toxicity studies, the submitter reported that rats were exposed to respirable particles (i.e., particle sizes less than 3.5 microns average diameter) of a partial aluminum potassium salt of polyacrylic acid. The exposure conditions (reported to be equivalent to 0.1, 0.3, and 1.0 of the current Threshold Limit Value (TLV) for respirable nuisance particulate dusts i.e., 5.0 mg/M^3/8 Hours), were as follows:

1) One 6-hour exposure with sacrifices at 1 day, 2 weeks, 4 weeks, and 13 weeks post-exposure;
2) Five 6-hour exposures with sacrifices at 1 day, 4 weeks, and 13 weeks following the last exposure; and
3) Twenty 6-hour exposures with sacrifices at 1 day, 4 weeks and 13 weeks following the last exposure.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

The submitting company provided the following summary of the results obtained from the performed inhalation studies:

> "In all tests (but not in all animals of the lower dose concentrations and shorter exposures) macrophage cell and lung tissue damage was observed. The effect was dose related. At the lowest dose levels only small portions of lung were affected if any lesions were found in the animal, but the nature of the change was consistent. There was much resolution during the recovery periods, but it was not complete, and even after 13 weeks there were focal aggregations of mononuclear cells and some deposition of reticulin."

With regard to the performed in vitro mouse macrophage studies, the submitter reported that all substances were tested either as an "ultrasonicated gel" or as a "homogenized aqueous dilution of an ethanolic suspension." According to the submitter, all partial aluminum potassium polyacrylic acid samples of differing particle sizes (i.e., regular, fine, or milled fine) were found to be "moderately to highly toxic to cultured mouse peritoneal macrophages." The submitter also stated that "the results indicated that there was a selective toxic action for macrophages." In addition, the submitter reported that polyacrylic acid and the partial sodium salts of either polyacrylic acid or acrylic acid-starch graft were found to be toxic to cultured macrophages. The company reported that although the in vitro macrophage toxicity screening test predicts two in vivo responses to inhaled materials (i.e., macrophage toxicity and the potential for fibrogenesis), the in vitro study "does not remove the need for animal studies."

Submission Evaluation

The provided information indicates that the partial alumimum potassium salt of polyacrylic acid provoked an inflammatory reaction in the lungs. Even following a single 6-hour exposure, some rats still had lesions at 13 weeks. The severity of such pathological lesions depends on both the concentration of particles in the inspired air and the duration of exposure. The observed tissue response involved monocytes and fibroblasts. Therefore, some of the lesions would not be expected to resolve completely without necessarily producing symptoms. The reported lung lesions appear to resemble granulomas that occur following inhalation of certain microorganisms or some types of non-living particulates such as beryllium ores.

Current Production and Use

With the exception of polyacrylic acid, the chemical names provided by the submitting company were not sufficient to allow accurate indentification of the tested chemical substances.

A review of the production range (includes importation volumes) statistics for polyacrylic acid (CAS No. 9003-01-4), which is listed in the initial TSCA Inventory, has shown that between 11.3 million and 63.8 million pounds of this chemical were reported as produced/imported in 1977. [**]

The submitting company did not provide any use information for any of the compounds which were cited in the submission. According to secondary literature, polyacrylic acid is used as a tackifier and a flocculant, and in co-polymeric form as a binder for non-woven fabrics.

Comments/Recommendations

The submitting company stated that due to a lack of commercial success, its manufacture of a partial aluminum potassium salt of polyacrylic acid has been discontinued. The company also stated that no further animal toxicity studies involving any of the subject substances are planned.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the submitting company to provide complete copies of the final reports, including test protocols and data, from all of the *in vivo* and *in vitro* toxicity studies cited in the submission. The Chemical Hazard Identification Branch will also request the submitting company to provide additional information which will permit adequate identification of the tested chemical substances. In addition, the submitting company will be requested to describe the actions it has taken on a voluntary basis in response to the submitted toxicity information to warn workers and others and to reduce and/or eliminate exposure to polyacrylic acid and the partial sodium salts of both polyacrylic acid and acrylic acid-starch graft.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, OW/EPA, OSWER/EPA and ORD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

[**] This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0282-439
Page 1 of 3

DATE: APR 6 1982

SUBJECT: Status Report* 8EHQ-0282-0439

Approved 4/8/82

Revision Needed __________

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Dow Chemical Company submitted a summary of interim results from a chronic inhalation study of propylene oxide (PO; CAS No. 75-56-9) in male and female rats. According to Dow, the study is being conducted in the Netherlands and is co-sponsored by several European propylene oxide producers including one of Dow's subsidiaries. Dow reported that Wistar rats (European strain) had been exposed via inhalation to propylene oxide vapors at concentrations of 0, 30, 100, or 300 parts per million (ppm) for 6 hours/day, 5 days/week for approximately 28 months. The submitter stated that all remaining animals in all groups were sacrificed when mortality reached 50% in the control group. Dow also stated that the histopathology on the terminally sacrificed animals was in progress.

With regard to the results obtained from interim sacrifices conducted at 12, 18, and 24 months, Dow reported that the only unusual findings were "microscopically-detectable degenerative changes in the olfactory portions of the nasal mucosa of both male and female rats exposed to 100 or 300 ppm PO [propylene oxide]." In addition to these microscopic findings, Dow reported that the preliminary information which has been received thus far from the study co-sponsors included summarized findings from the gross pathology for all animals from the chronic portion of the study and summarized histopathologic findings from animals which died spontaneously or had been killed moribund prior to the terminal sacrifice.

Dow reported that although the company has not yet received any statistical analyses or interpretive comments from the European investigators, it is Dow's opinion that the interim results (as received by Dow) support the following preliminary conclusions:

"1) There appears to be an increased mortality in both male and female rats associated with chronic inhalation exposure to 300 ppm of PO.

***NOTE:** This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

"2) There appears to be an increased number of female rats with a grossly-observed mammary tumor (or mass suggestive of a mammary tumor) in groups exposed to 100 or 300 ppm PO.

3) Based on the limited histopathologic examination of rats dying spontaneously or killed moribund prior to the terminal sacrifice, there are indications of an increased incidence of benign mammary tumors, as well as increased numbers of benign mammary tumors per animal with a mammary tumor, in the groups exposed to 100 or 300 ppm PO."

Dow stated that due to the preliminary nature of the data received and Dow's unfamiliarity with the test conditions and the strain of rats used in the study, "additional interim conclusions from the data available would not be scientifically supported." In addition, Dow stated that "subsequent developments in the course of this study may modify current interim conclusions" and that "final conclusions must await the completion of all phases of this study."

Submission Evaluation

The significance of the observed degenerative changes in the olfactory portions of the nasal mucosa of rats exposed to 100 or 300 ppm propylene oxide may become more clear when additional histopathology findings are submitted. It is possible that the observed lesions could be metaplasia resulting from chronic irritation. At the present time, however, the reported mortality following inhalation exposure to PO appears to be dose-related, with female rats probably somewhat more susceptible. In addition, the increased incidence of mammary tumors in female rats also appears to be dose related.

Current Production and Use

A review of the production range (includes importation volumes) statistics for propylene oxide (CAS No. 75-56-9), which is listed in the initial TSCA Inventory, has shown that between 710 million and 1.75 billion pounds of this chemical were reported as produced/imported in 1977. **/

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

According to secondary literature sources, the major use of propylene oxide is as an intermediate in the manufacture of polyether polyols, which are used primarily to produce polyurethane foams. The chemical is also used to make propylene glycol, dipropylene glycol, glycol ethers, and synthetic glycerin. Propylene oxide has also been used as an insecticidal and fungicidal fumigant for sterilizing a wide variety of materials including medical equipment and foodstuffs.

Comments/Recommendations

The Dow Chemical Company stated that in accordance with the company's longstanding policy, Dow's employees and propylene oxide customers and other producers of the chemical were being notified of the interim results from the subject study. Dow also stated that a copy of the final report from the study would be provided to EPA when that report is received by the company.

In 1976, the International Agency for Research on Cancer (IARC) conducted an evaluation of the carcinogenic risk from exposure to propylene oxide (IARC Monograph; Volume 11; 1976). According to that evaluation, propylene oxide was determined to be carcinogenic (i.e., produced local sarcomas via subcutaneous injection) in a "limited" study in rats. The National Cancer Institute/National Toxicology Program (NCI/NTP) is currently testing propylene oxide for carcinogenicity via inhalation in rats and mice. In addition, the Test Rules Development Branch (TRDB/AD/EPA) is currently reviewing chemical toxicity/exposure data on propylene oxide as it pertains to the Interagency Testing Committee (ITC) recommended class of "Alkyl Epoxides."

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Dow Chemical Company to provide complete copies of all interim reports/data which the company has received thus far and may receive in the future that pertain to the cited co-sponsored chronic inhalation study of propylene oxide in rats.

b) The Chemical Hazard Identification Branch will consider the preparation of a Chemical Hazard Information Profile (CHIP) on propylene oxide.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, NCI/NTP, OW/EPA, OSWER/EPA, OANR/EPA, ORD/EPA, OPP/OPTS and TRDB/AD. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0382-0440 S
Page 1 of 4

DATE: APR 20 1982

SUBJECT: Status Report* 8EHQ-0382-0440 S

Approved 4/20/82

Revision Needed ____________

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Shell Oil Company provided summarized results from two acute inhalation toxicity studies of para-tertiary-butyl benzoic acid (ptBBA; CAS No. 98-73-7) dust in rats. Specifically, the company provided: (1) final results from a study involving a single 4-hour inhalation exposure to ptBBA at concentrations of 0, 0.57, 0.7, 1.0 or 1.9 g/m^3 air; and (2) preliminary results from a study involving 6-hour repeated (7-days) inhalation exposures to ptBBA at concentrations of 12.5, 106, or 525 mg/m^3 air.

The conclusions drawn from the 4-hour inhalation study were reported as follows:

"1. Single 4-hour exposure of Fischer 344 rats to ptBBA dust at concentrations up to 1.9 g/m^3 did not result in extensive mortality; the acute 4-hour LC50 for ptBBA dust was greater than 1.9 g/m^3.

"2. Single 4-hour exposure of Fischer 344 rats to ptBBA dust at concentrations of 0.52 to 1.9 g/m^3 resulted in significant treatment-related toxic effects which included:

"a. Decreased rate of body weight gain in both male and female rats of all dose groups during days 0-7 and 0-14 post-exposure.

"b. A CNS lesion characterized grossly by forelimb neuropathy and described as multifocal poliomyelopathy at the microscopic level; females developed this lesion more frequently than males.

"c. Testicular effects in males characterized grossly by approximately 50% reduction in testes weight in all treated groups and accompanied by consistent pathological changes at the microscopic level.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

> "3. A no-effect level was not established in this study for any of the three changes listed in 2 above which followed exposure to ptBBA dust."

With regard to the results of the 7-day inhalation study, the mortality observed during that study was reported to be greater for male rats than for the females (i.e., 7/8 males versus 2/8 females died at the high dose (525 mg/m^3) and 2/8 males versus 1/8 females died at the middle dose (106 mg/m^3); no deaths were observed at the lowest dose (12.5 mg/m^3) administered). The following information was provided on other toxicologic effects observed in the 7-day study:

> "Toxicological effects similar to those seen following a single 4-hour exposure to ptBBA were also seen following repeated exposures at lower concentrations; these included testicular effects, forelimb neuropathy and decreased rate of body weight gain. In addition, there were apparent effects seen in livers of females at all treatment levels, and in males in the mid and high levels. Other effects included changes seen at the high level and occasionally at the mid level in other parameters not examined in the acute study (hematology, clinical chemistry and histopathology)."

With regard to the above preliminary findings, the submitting company stated that "statistical analysis of all data has not yet been completed, and histopathological examinations are still in progress."

In its submission, the Shell Oil Company reported that adverse testicular effects and neuropathy in rats exposed to ptBBA are well known. In addition, the company stated that the cadmium salt of ptBBA has been reported to cause adverse testicular effects via dermal exposure and that two ptBBA precursors (i.e., para-tert-butyl toluene and para-tert-butyl benzaldehyde) have been reported to produce testicular atrophy and damage via the oral route of administration. The Shell Oil Company also reported that based on a previous epidemiology study (conducted by an independent research group) it was concluded that ptBBA, at the levels of exposure experienced by male workers at a Shell ptBBA production site, "did not have an apparent clinical or epidemiologic effect on testicular function." Shell reported, however, that "after careful consideration of this human study as well as the preliminary data from the rat inhalation study, the question of substantial risk remains, primarily because of the rat's sensitivity to ptBBA at the levels tested."

Submission Evaluation

Para-tertiary-butyl benzoic acid (ptBBA) is toxic to rats and is known to cause at least four significant types of adverse effects: 1) lesions in the kidney tubules, 2) lesions in the testes, 3) lesions in the liver, and 4) lesions in the spinal cord and perhaps in the brain stem. The compound has been shown to be toxic via ingestion, skin application and inhalation. When inhaled, ptBBA can also produce lesions in the lung. The most significant lesions, so far as survival is concerned, appear to be those in the kidney tubules. Such lesions can cause severe electrolyte and pH changes in the tissues.

The central nervous system lesions appear to involve only the gray matter, mostly in the spinal cord and perhaps the medulla. The observed lesions resemble those of neurolathyrism rather than those of anterior poliomyelitis.

The observed liver lesions are probably due to a direct effect on hepatocytes as evidenced by the numerous enzyme changes. The increased liver weight may be a reflection of enzyme induction or deposition of ptBBA or fat. It is possible that most of the toxicity caused by ptBBA is due to a high lipid/water partition coefficient for the compound.

With regard to the cited epidemiology study at the Shell plant, it would be of interest to know if the workers exposed to ptBBA were examined for kidney, liver and pulmonary function.

Current Production and Use

A review of the production range (includes importation volumes) statistics for para-tertiary-butyl benzoic acid (CAS No. 98-73-7), which is listed in the initial TSCA Inventory, has shown that between 1 million and 10 million pounds of this chemical were reported as produced/imported in 1977. This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Para-tertiary-butyl benzoic acid is used as a resin modifier and regulator for alkyd resins which are used in automobile enamels, implement enamels, and aerosol finishes. The chemical is also used in cutting fluids and as a raw material in the manufacture of unsaturated polyester resins, as an intermediate for speciality organic chemicals, and as a corrosion inhibitor.

Comments/Recommendations

The Shell Oil Company reported that a copy of its submission had been provided to both NIOSH and OSHA. The Material Safety Data Sheet (MSDS) which was provided by the company in its submission states in part that overexposure to ptBBA via ingestion, inhalation, or absorption through the skin may result in adverse effects on the testes, kidneys, liver, and lungs. In addition, the MSDS recommends that ptBBA not be used in cutting fluids.

EPA has received and evaluated TSCA Section 8(e) submissions on a mixture of the cadmium salts of ptBBA and benzoic acid (8EHQ-1180-0375 S et seq.), and p-tert-butyl benzaldehyde and p-tert-butyl toluene (8EHQ-1281-0421 S et seq.). EPA has also received (on a "For Your Information (FYI)" basis) and evaluated the results from the study of testicular functions of Shell workers exposed to ptBBA (FYI-OTS-0780-0081 et seq.). The Chemical Hazard Identification Branch (CHIB/AD/EPA) is currently preparing Chemical Hazard Information Profiles (CHIPs) on ptBBA, p-tert-butyl benzaldehyde, and p-tert-butyl toluene.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Shell Oil Company to provide, when available, complete copies of the final reports, including protocols and data, from the two *in vivo* inhalation studies of ptBBA which were cited in the submission. The submitting company will also be asked if it has tested or plans to test kidney, liver, and/or pulmonary functions of workers exposed to ptBBA. In addition, the company will be requested to describe the actions it has taken on a voluntary basis in response to the submitted information to reduce and/or eliminate exposure to ptBBA.

b) The Chemical Hazard Identification Branch will include a discussion of the findings reported in the present submission in the Chemical Hazard Information Profile (CHIP) on ptBBA which is currently in preparation.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, OW/EPA, OSWER/EPA, OANR/EPA, and ORD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0382-0441
Page 1 of 3

DATE: APR 13 1982

SUBJECT: Status Report* 8EHQ-0382-0441

Approved – 4/14

Revision Needed ______

FROM: Justine L. Welch JW Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Dow Chemical Company provided the summarized results of an inhalation teratology study of 1,3-butadiene (CAS No. 106-99-0) in rats. This study was reportedly sponsored by the International Institute of Synthetic Rubber Producers and conducted in England.

The submitter stated that groups of mated female Sprague-Dawley rats were exposed to 0, 200, 1,000 or 8,000 ppm of 1,3-butadiene via inhalation for 6 hours per day from days 6-15 of gestation, the period of major organogenesis for rats. According to the submitter, the final laboratory report concluded that:

> "1. Administration of butadiene by the inhalation route, in whole body exposure chambers, during the period of organogenesis elicited maternal toxicity and, as a result, embryonic growth retardation and slight embryolethality at all dose levels (200-8,000 ppm v/v). The magnitude of the effect was dose-related.
>
> "2. At the highest exposure level (8,000 ppm v/v) there was also an indication of teratogenicity due to the presence of major fetal defects which could not be attributed to any other factor. There was no evidence of teratogenicity at the lower exposure levels (200 and 1,000 ppm v/v)."

The Dow Chemical Company stated that following a detailed analysis and evaluation of the data by its scientific staff, the company concluded that "exposure of rats to 8,000 ppm [1,3-butadiene] during days 6-15 of gestation resulted in a significant increase in major skeletal anomalies." However, Dow also stated that the company disagreed with the conclusions of the study with respect to the effect of 1,3-butadiene on post-implantation losses because the rates of these losses among dose groups were not significantly different from the control group

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***NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.**

(i.e., 3.6, 6.0, 4.9, and 7.3% at 0, 200, 1,000, and 8,000 ppm, respectively). The submitter further stated that post-implantation losses of up to 10% have been observed historically in control Sprague-Dawley rats in Dow's laboratory. According to Dow, based on these reasons, the company believes that the post-implantation losses observed in all exposure groups were not a direct result of 1,3-butadiene exposure.

Submission Evaluation

The reported teratogenicity of 1,3-butadiene is not necessarily surprising. It is known that 1,3-butadiene can adversely affect the central nervous system following inhalation exposure. Other volatile hydrocarbons causing similar effects when inhaled or ingested by humans can also produce teratogenic effects e.g., alcohol-fetal syndrome.

The submitting company disagreed with the conclusion of the performing laboratory that embryonic growth retardation and embryolethality were dose related. To support this position, the submitting company provided percentages of post-implantation losses in the study compared to the rate of such losses in historical control Sprague-Dawley rats at its own laboratory. However, in order to perform a meaningful statistical analysis and evaluation of the study, the Agency needs a full copy of the final report, including test protocols and actual data on post-implantation losses, maternal toxicity, growth retardation, and all other experimental parameters.

It should also be pointed out that the rate of post-implantation loss in historical controls at the laboratory of the submitter may not necessarily represent rates at other laboratories where conditions may vary. No data on historical controls at the performing laboratory in England were provided by the submitter.

Current Production and Use

A review of the production range (includes importation volumes) statistics for 1,3-butadiene (CAS No. 106-99-0), which is listed in the initial TSCA Inventory, has shown that between 2.1 billion and 7.3 billion pounds of this chemical were reported as produced/imported in 1977. **/

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

According to secondary literature sources and a recently completed draft Chemical Hazard Information Profile (CHIP) on 1,3-butadiene, the subject chemical is used as a polymer component in the manufacture of styrene-butadiene and nitrile rubber products, in the manufacture of polybutadiene, neoprene and other elastomers, in the manufacture of resins, and as a chemical intermediate.

Comments/Recommendations

The Agency previously received and evaluated another TSCA Section 8(e) submission on 1,3-butadiene (8EHQ-1080-0370 et seq.). The Chemical Hazard Identification Branch (CHIB/AD/EPA) has completed a draft Chemical Hazard Information Profile (CHIP) on 1,3-butadiene (09/18/81).

a) In order for EPA to properly evaluate the results of the inhalation teratology study of 1,3-butadiene cited in this submission, the Chemical Hazard Identification Branch will request the Dow Chemical Company to provide a complete copy of the final report, including protocols and data.

b) The Chemical Hazard Identification Branch will request the Dow Chemical Company to describe the actions it has taken on a voluntary basis in response to the submitted information on 1,3-butadiene, to warn workers and others, and to reduce and/or eliminate exposure to the subject chemical.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, NCI/NTP, OANR/EPA, OW/EPA, OSWER/EPA and ORD/EPA. A copy of the status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0482-0442
Page 1 of 3

DATE: APR 22 1982

SUBJECT: Status Report* 8EHQ-0482-0442

Approved 5/4/82

Revision
Needed

FROM: Justine L. Wel[illegible] Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Stepan Chemical Company reported that dimethyl sulfate (CAS No. 77-78-1) had been identified as an impurity in one of the company's products (Stepan Agent 291-83). According to the submitter, Stepan Agent 291-83 contains the following sulfonated methyl esters: tetradecanoic acid, 2-sulfo-, 1-methyl ester (CAS No. 29454-23-7); hexadecanoic acid, 2-sulfo-, 1-methyl ester (CAS No. 58849-75-5); octadecanoic acid, 2-sulfo-, 1-methyl ester (CAS No. 3076-26-4). The submitter reported that the dimethyl sulfate impurity was discovered during air sampling of the "head space" of a retained product sample. The company stated that the method of analysis was qualitative and sensitive to levels of dimethyl sulfate ranging from 1 to 50 parts per million. The submitter also stated that air samples from the processing area where the sulfonated methyl esters were being synthesized did not have any detectable levels of dimethyl sulfate.

The Stepan Chemical Company stated that dimethyl sulfate is formed at temperatures greater than 100°C under anhydrous conditions. In addition, the company reported that it appears that the dimethyl sulfate impurity can be eliminated by digestion of Stepan Agent 291-83 with small volumes of water. The company also reported that "neutralization of sulfo methyl esters with caustic is effective in destroying dimethyl sulfate." The submitting company reported that it believes that the "risk of exposure to the impurity is limited to workers who may process the acid in open reaction vessels."

Submission Evaluation

Dimethyl sulfate is known to be irritating to the skin, mucous membranes and lungs. Following absorption, the compound can adversely affect various internal organs - the most serious toxicity being in the kidneys. The use of dimethyl sulfate as a war gas showed it to have immediate blistering actions like those of mustard gas and delayed pulmonary effects like those of phosgene.

***NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.**

The presence of dimethyl sulfate as an impurity as described in the present submission is not likely to invoke any of the above effects with the possible exception of mild irritation of skin, eyes, throat and bronchi. What is of concern, however, would be chronic exposure to dimethyl sulfate, an alkylating agent which has been shown to be a carcinogen in animals and possibly humans.

In 1974, the International Agency for Research on Cancer (IARC) conducted an evaluation of the carcinogenic risk to humans from exposure to dimethyl sulfate (IARC Monograph; Volume 4; 1974). With regard to the animal data available at that time, IARC found that dimethyl sulfate was "carcinogenic in the rat, the only species tested, by inhalation, subcutaneous injection, and following pre-natal exposure....and carcinogenic to the rat in a single-dose exposure." With regard to available human data, IARC stated that certain case reports raised "suspicion as to the possible carcinogenicity of dimethyl sulfate in man, but good epidemiological evidence [was] not available to confirm this."

Current Production and Use

According to Stepan, its current manufactured volume of sulfonated methyl esters is less than 1 million pounds per year. A review of the production range (includes importation volumes) statistics for the cited sulfonated methyl esters (CAS No. 29454-23-7, 58849-75-5, and 3076-26-4), which are listed in the initial TSCA Inventory, has shown that between 10 thousand and 100 thousand pounds of each of these chemicals were reported as produced/imported in 1977. **/

The Stepan Chemical Company reported that "sulfonated methyl esters are chemical process intermediates which are used to manufacture surfactants and other specialty chemicals by neutralization or by further processing." The submitter also reported that the company does not know of any commercial use(s) for the acid form of the types of materials in which dimethyl sulfate was detected.

A review of the production range (includes importation volumes) statistics for dimethyl sulfate (CAS No. 77-78-1), which is listed in the initial TSCA Inventory, has shown that between 20 million and 100 million pounds of this chemical were reported as produced/imported in 1977. **/

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

According to secondary literature sources, the main use of dimethyl sulfate is as a methylating agent in the synthesis of organic chemicals, including certain pharmaceuticals.

Comments/Recommendations

The Stepan Chemical Company reported that it has notified its customer of the potential problem and that investigations of certain process alterations are underway which the company expects will eliminate dimethyl sulfate from the product. In addition, the submitting company reported that it plans to continue monitoring for dimethyl sulfate in process areas.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will screen the reported information in order to determine the need for further assessment.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, NCI/NTP, OW/EPA, OSWER/EPA, OANR/EPA, and ORD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0482-0443
Page 1 of 2

DATE: MAY 3 1982

SUBJECT: Status Report* 8EHQ-0482-0443

Approved 5/4

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The CIBA-GEIGY Corporation provided a full copy of the final report of a two-year rat inhalation (snout only) study of Irgastab® 2002 (nickel-bis-[ethyl(3,5-di-tert-butyl-4-hydroxybenzyl)phosphonate]; CAS No. 30947-30-9) which was conducted by CIBA-GEIGY Limited of Basel, Switzerland. According to the submitter, groups of 40 rats (20 animals per sex) were exposed to Irgastab® 2002 dust at target concentrations of 0, 10, or 100 mg/m^3 for 2 hours per day, 5 days per week for 105 weeks. The following results summary was provided by the submitter:

> "Results indicated poor survival at the high dose since, by 18 months, there was 80% mortality in females and 50% mortality in males, with only 3 males and two females available at final sacrifice. No survival differences were seen between control and low dose animals. The respiratory tract was the target organ. Two of the three males surviving to final sacrifice each developed a well differentiated squamous cell carcinoma of the lung. From the available histopathology results, no mention of preneoplastic changes were evident in the lungs of male animals surviving up to 682 days or in any female up to final sacrifice."

In its submission the CIBA-GEIGY Corporation stated that it does not believe that Irgastab® 2002 "represents a substantial risk of injury to human health during manufacture, processing, use or disposal..." and also stated that the company's "currently recommended handling precautions already protect against inhalation exposure by specifying the use of local ventilation and a NIOSH approved dust respirator or organic vapor respirator in heated operations."

Submission Evaluation

The carcinogenic, irritant (skin, pulmonary), and sensitizing effects of nickel salts are well known. This well designed and executed study further establishes the carcinogenicity and pulmonary irritation. The low dose had sufficient time to produce methemoglobinemia with typical reticulocyte and erythrocyte responses. The high doses produced sufficient pulmonary capillary changes to cause hemoconcentration (i.e., increased blood cell concentrations and hematocrit).

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

A review of the production range (includes importation volumes) statistics for the subject chemical (CAS No. 30947-30-9), which is listed in the initial TSCA Inventory, has shown that between 100 thousand and 1 million pounds were reported as produced/imported in 1977.**/

The CIBA-GEIGY Corporation reported that Irgastab® 2002 is used as a light stabilizer for plastics. The submitter also reported that Irgastab® 2002 contains approximately 8% nickel and is commercially available as a dihydrate.

Comments/Recommendations

In order to re-emphasize the necessity for handling Irgastab® 2002 in a safe manner, the CIBA-GEIGY Corporation reported that the Material Safety Data Sheet for Irgastab® 2002 "has been revised to more strongly emphasize the danger of inhalation exposure" and that the Irgastab® 2002 container label was being revised for reprinting. CIBA-GEIGY also reported that its "laboratory and plant personnel handling this product have been advised orally of the submitted findings and will receive copies of the revised Safety Data Sheet, label and Toxicology Bulletin." In addition, the company stated that its customers, as well as those persons who have requested samples, are being notified by letter of the new toxicity findings and the re-emphasized proper handling precautions.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will consider the preparation of a Chemical Hazard Information Profile (CHIP) on nickel-bis-[ethyl(3,5-di-tert-butyl-4-hydroxybenzyl)phosphonate].

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, ORD/EPA, OW/EPA and OSWER/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: JUN 28 1982

SUBJECT: Status Report* 8EHQ-0582-0444

Approved 6/29

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Velsicol Chemical Corporation submitted a copy of a manuscript entitled: "Mortality and Benzotrichloride [BTC] Exposure: A Study of Mortality in a Factory Manufacturing Chlorinated Toluenes Involving Exposure to Benzotrichloride, Including an Analysis by the Method of Regression Models in Life-Tables," by T. Sorahan and J. Waterhouse, Cancer Epidemiology Research Unit, University of Birmingham, Birmingham, England. Specifically, the performed epidemiologic study involved worker exposure to various chemical substances, including benzal chloride (CAS No. 98-87-3), benzoyl chloride (CAS No. 98-88-4), benzyl chloride (CAS No. 100-44-7), and benzotrichloride (BTC; CAS No. 98-07-7), in the chlorinated toluenes manufacturing process. In its submission, Velsicol stated that although the company was not sure of the exact status or date of the provided manuscript, the company had determined that EPA was not aware of the document or its content.

Due to the fact that both the Velsicol and EPA copies of the submitted manuscript were of very poor quality, the Chemical Hazard Identification Branch (CHIB/AD/EPA) requested a better copy directly from the lead English author. In response to EPA's request, the author provided the most recent manuscript which had a new title: "A Mortality Study of Workers in a Factory Manufacturing Chlorinated Toluenes" by T. Sorahan, J. Waterhouse, M. Cooke, E. Smith, J. Jackson, and L. Temkin. The author stated that the manuscript had been submitted to the Journal of Applied Toxicology for publication and that EPA would receive a copy of the published version as soon as it becomes available.

In the cover letter to its Section 8(e) submission, Velsicol pointed out that the authors concluded that "despite [certain] reservations and bearing in mind the results of other epidemiological and toxicological studies, the most reasonable interpretation of this study is that BTC is a potential human carcinogen." However, in the copy of the more recent manuscript which EPA obtained directly from England, the authors concluded that "despite [certain] reservations and bearing in mind other reports and the results of toxicological studies, a reasonable interpretation of this study is that BTC should be considered to be a potential human carcinogen."

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In its TSCA Section 8(e) submission, Velsicol stated that the company is treating benzotrichloride as a potential human carcinogen. The submitting company also reported that although it has industrial hygiene monitoring data, no precise estimate of worker exposure to BTC can be made at the present time because the analytical method of detection has not been validated. Velsicol reported, however, that it is attempting to develop a valid method for detecting BTC and that when such a method becomes available monitoring studies would be conducted.

Submission Evaluation

The following evaluation pertains to the author-supplied revision of the manuscript which was initially submitted by the Velsicol Chemical Corporation.

Sorahan et al. examined the patterns of deaths among 953 workers employed at an English chlorinated toluenes manufacturing facility at some time between January 1, 1961 and December 31, 1970. The vital status of each of these workers, 163 of whom were known only to have been exposed to a variety of chlorinated toluenes, was determined after exposure classification. This may have introduced a bias by including more deaths among the so-called exposed group.

Two types of statistical analyses of the obtained data were performed by the investigators. One type, which focused on standardized mortality ratios (SMRs), showed greater death rates than for all England and Wales in the following three instances:

1. among all workers, for all causes and for all cancer causes,

2. among workers said to have been exposed, for all causes, for all cancer causes, for cancers of the digestive system and of the respiratory system, and

3. among unexposed workers, only for cancers of the mouth and throat.

The above increases were diminished when compared to mortality in the local (Merseyside) area, but remained elevated, significantly so for the exposed workers for all cancer causes of death, cancers of the digestive system, and all causes of death.

The other type of statistical analysis used was the method of regression models in life tables which was a means of using exposure status within the worker group to look for associations with mortality, while controlling for age at entry to the survey and the year of first employment. By this method, when length of post-1937 employment was taken as a surrogate for cumulative exposure magnitude, only cancer deaths as a whole were considered statistically significantly affected by exposure status. The observed cancers were almost all digestive or respiratory, but neither category individually showed significant effect of exposure. Mortality differences were almost entirely attibutable to those workers first employed prior to 1951.

The conduct of the performed epidemiologic study limits the interpretations of its results. While acknowledging this reservation, the authors used animal toxicological evidence to infer that, among the variety of chlorinated toluenes present, benzotrichloride was the substance most likely associated with the increased cancer mortality. However, based solely on the results of the epidemiologic study and the limitations of the study, a reasonable interpretation of the findings would be that they are suggestive of an association between cancer mortality and exposure to one or more of the chemicals in the chlorinated toluenes manufacturing process at the facility.

Current Production and Use

A review of the production range (includes importation volumes) statistics for the subject substances, which are listed in the initial 1977 TSCA Inventory, has shown that the following production/importation ranges were reported:

Chemical Name	CAS Number	Approximate Prod./Import. Range
Benzal Chloride	98-87-3	2 million to 20 million pounds
Benzoyl Chloride	98-88-4	10 million to 52 million pounds
Benzyl Chloride	100-44-7	52 million to 110 million pounds
Benzotrichloride	98-07-7	10 million to 50 million pounds

The above ranges do not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor do they include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Benzal chloride is used as a chemical intermediate in the manufacture of benzaldehyde and cinnamic acid. Benzoyl chloride is used as a chemical intermediate in the acylation of alcohols, phenols, and amines, and in the manufacture of benzoyl peroxide and dye intermediates. Benzyl chloride is used as a chemical intermediate in the manufacture of benzyl compounds, perfumes, pharmaceuticals, dyes, synthetic tannins and artificial resins. Benzotrichloride is used mainly in the manufacture of synthetic dyes and other organic chemicals, including some pesticides.

Comments/Recommendations

In addition to its reported treatment of BTC as a potential human carcinogen and its efforts to develop a valid analytical method for detecting and monitoring BTC exposure in the workplace, the Velsicol Chemical Corporation reported that its workers and customers had been notified of the submitted information. The company also reported that it planned to meet with staff of the National Institute for Occupational Safety and Health (NIOSH) to discuss benzotrichloride. In addition, the company reported that it was in the process of developing a total benzotrichloride strategy which may possibly include an epidemiologic study.

EPA has received and evaluated several other TSCA Section 8(e) and "For Your Information (FYI)" submissions on benzotrichloride, benzyl chloride, benzal chloride, and/or benzoyl chloride (8EHQ-0777-0001; 8EHQ-0178-0041; 8EHQ-0478-0138 P; 8EHQ-0678-0180; and 8EHQ-0980-0360; FYI-OTS-1180-0107; and FYI-OTS-0981-0122). In addition, the Chemical Hazard Identification Branch (CHIB/AD/EPA) is currently preparing and/or evaluating Chemical Hazard Information Profiles (CHIPs) on benzotrichloride, benzal chloride, and benzoyl chloride; a CHIP on benzyl chloride was completed in 1977.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Velsicol Chemical Corporation to keep EPA apprised of the results of the company's BTC monitoring efforts and clinical/epidemiologic studies (if performed) involving human exposure to BTC in the workplace.

b) The Chemical Hazard Identification Branch will consider including a discussion of the submitted information in the Chemical Hazard Information Profiles on benzotrichloride, benzal chloride, and benzoyl chloride which are currently in preparation or undergoing evaluation.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to OSHA, NIOSH, CPSC, FDA, NCI/NTP, OPP/OPTS/EPA, ORD/EPA, OW/EPA, and OSWER/EPA. In addition, a copy of the status report will be provided to the Industry Assistance Office (IAO/OTS/OPTS/EPA) and to the Office of Toxics Integration (OTI/OPTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0582-0445
Page 1 of 3

DATE: JUN 16 1982

SUBJECT: Status Report* 8EHQ-0582-0445

Approved 6/12

Revision Needed

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Sherwin-Williams Company submitted summarized preliminary results from a 3-week rabbit dermal exposure study of 2-dodecyl-9-H-thioxanthen-9-one (DTX; no known CAS Registry Number). According to the submitter, oral reports received from the performing laboratory indicated that DTX both bioaccumulated and caused dose-dependent severe internal hemorrhaging in all animals. Sherwin-Williams reported that a workup of retained tissue samples and an analysis of blood samples were currently underway.

In its submission, Sherwin-Williams noted that the 3-week dermal application study of DTX was conducted based on the results of acute toxicity tests which were submitted by the company to EPA in a "Premanufacturing Notice" (PMN #81-500) pursuant to Section 5 of the Toxic Substances Control Act (TSCA).

Submission Evaluation

As previously stated, the 3-week rabbit dermal application study of DTX was initiated by the Sherwin-Williams Company to more clearly define certain acute toxicity test results which were submitted to EPA as part of PMN-81-500. The post-mortem findings from those acute toxicity tests included internal hemorrhaging in rabbits following a single high dose (2g/kg) of DTX applied to the skin.

If the proposed and previously provided protocol for the 3-week rabbit dermal application study was followed by the performing laboratory, the reported preliminary findings that dermally applied DTX both bioaccumulated and caused dose-dependent severe internal hemorrhaging could be cause for concern depending on the degree of human exposure to DTX and especially if such exposure occurs via the dermal route. In addition, the reported finding that DTX bioaccumulates is consistent with EPA's prediction which was based on a log P value which was calculated for the compound.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

A more complete evaluation of the results of the 3-week study of DTX is not possible without a complete copy of the final laboratory report which should include the final study protocol and all data obtained at necropsy and from the post-mortem analyses of retained tissue and blood samples.

Current Production and Use

In its TSCA Section 8(e) submission, Sherwin-Williams reported that DTX is not a commercial product and that only 500 pounds of DTX have been manufactured and sold under a Test Market Exemption (TME #81-17) and extension. The company also reported in its TSCA Section 8(e) submission that approximately 20 customers have received samples of DTX.

In its application for a Test Market Exemption (TME #81-17), the Sherwin-Williams Company reported that dodecylthioxanthone (synonyms: DTX, UCI-200, Ultra-Cure^{TM} I-200) was a yellow-brown liquid composed mainly of mixed alkylthioxanthones with alkyl side-chains varying in length from 10 to 14 carbon atoms with the C_{12} alkyl component (dodecylthioxanthone) being the most abundant. The company also reported that the total alkylthioxanthone content was approximately 89%.

With regard to possible use patterns, Sherwin-Williams reported in its DTX Test Market Exemption application that "the intended use of this product is as a photoinitiator additive in UV light cured inks and coatings" and that "conceivable application might include notebook covers; brochures; display boards; signs; mirror decoration; bottle, can and plastic cup exteriors; electrical circuitry; wall coverings; and other areas that are traditionally decorated with inks, coatings and paints."

In its Test Market Exemption application, Sherwin-Williams also reported that in the use of this material in cured films, concentrations of approximately 1% may exist and that dermal exposure is possible. The company also reported, however, that proper industrial hygiene observed during handling would insure "zero or negligible exposure."

Comments/Recommendations

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Sherwin-Williams Company to provide a complete copy of the final report including the final study protocol and all data obtained from its 3-week rabbit dermal application study of DTX. In addition, the company will be requested to describe the actions it has taken on a voluntary basis in response to the submitted toxicity information to warn workers and others and to reduce and/or eliminate exposure to DTX. The Sherwin-Williams Company will also be asked about its plans to conduct additional studies designed to further define the toxicity of DTX.

b) The Chemical Hazard Identification Branch will screen available information on DTX in order to determine the need for further assessment.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, OSWER/EPA, OW/EPA, ORD/EPA, and CCD/OTS/EPA. A copy of this status report will also be provided to the Industry Assistance Office (IAO/OTS/EPA) and the Office of Toxics Integration (OTI/OPTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: JUN 23 1982

SUBJECT: Status Report* 8EHQ-0682-0446 S

Approved 6/24

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Standard Oil Company (Indiana), on behalf of the Amoco Oil Company (a wholly owned subsidiary), submitted summarized preliminary results from several sub-acute/sub-chronic in vivo (rat) inhalation studies of selected naphtha refinery streams and a hydrocarbon blend reported to contain one of those streams. Specifically, the tested substances were: 1) a full-range alkylate naphtha (CAS No. 64741-64-6), 2) a light straight run naphtha (CAS No. 64741-46-4), 3) a light catalytic cracked naphtha (CAS No. 64741-55-5), and 4) a hydrocarbon blend containing approximately 22% full-range alkylate naphtha. The exact chemical composition of the blend was claimed by the company as TSCA Confidential Business Information.

The submitting company reported that a 21-day inhalation toxicity study was conducted with the full-range alkylate naphtha. According to the company, groups (10 animals/sex/group) of mature Sprague-Dawley rats were exposed to the test substance at graded concentrations of 15.0, 5.0, or 1.5 mg/l in whole-body exposure chambers for six hours per day for a total of 15 exposures in 21 days. Two other groups were exposed to either filtered or "environmental" air and served as controls. The company reported that all of the animals were sacrificed at the end of the 21-day period. The following table contains the reported preliminary histopathology findings for degeneration/necrosis and regeneration in the renal proximal tubules.

	Degeneration/Necrosis		Regeneration	
Exposure Level	Males	Females	Males	Females
15.0 mg/l	10/10	0/10	10/10	0/10
5.0 mg/l	10/10	0/10	9/10	0/10
1.5 mg/l	10/10	0/10	2/10	0/10
Filtered Air Control	0/10	0/10	2/10	0/10
Environmental Air Control	0/10	0/10	0/10	0/10

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

In a similar 21-day inhalation study on light straight run naphtha, the submitting company reported that although "nephropathic effects in male rats were also observed," the results of the study were "questionable due to a high incidence of respiratory problems in all animals, including controls."

With regard to the results obtained from a 21-day inhalation study conducted with light catalytic cracked naphtha, the submitter reported that "at the tested concentration levels of 0.2, 2.0, and 20.0 mg/l, no evidence of any treatment-related lesions were observed."

The Standard Oil Company (Indiana) also reported that a 90-day inhalation study was conducted with groups (20 animals/sex/group) of Sprague-Dawley rats exposed to a hydrocarbon blend containing approximately 22% full-range alkylate naphtha. The company reported that in this study, three groups of rats were exposed (whole-body) to the blend at graded concentrations of 15.0, 1.5, or 0.5 mg/l for six hours per day, five days per week for the 90 day period. As in the previous 21-day studies, two additional groups of rats exposed to filtered or "environmental" air served as controls. The submitter reported that at the end of the 90-day period, 10 males and 10 females from each group were sacrificed for histopathologic examination and the remaining rats held for a recovery period of one month then sacrificed and examined. The following table shows the reported preliminary histopathology results for renal proximal tubular degeneration/necrosis observed at the end of 90 days and following the 1-month recovery period.

Exposure Level	End of Exposure		1-Month Recovery	
	Males	Females	Males	Females
15.0 mg/l	5/10	0/10	4/10	0/10
1.5 mg/l	7/10	0/10	5/10	0/10
0.5 mg/l	1/10	0/10	1/10	0/10
Filtered Air Control	0/10	0/10	0/10	0/10
Environmental Air Control	0/10	0/10	0/10	0/10

Finally, the submitting company reported that a 21-day inhalation study (similar to the other 21-day studies cited) of the hydrocarbon blend "produced no evidence of kidney damage in rats exposed to the same concentrations employed in the 90-day study."

Based on its reported data, the Standard Oil Company (Indiana) stated that "there is reason to believe that certain naphtha streams may be responsible for the degenerative kidney effects seen in males rats" and cited a previous TSCA Section 8(e) submission (8EHQ-1079-0312 et seq.; Exxon Company, U.S.A.) in which similar adverse kidney effects in male rats exposed to ISOPAR C (a light alkylate naphtha) were reported. The Standard Oil Company (Indiana) also stated that "although highly speculative, these effects might also be related to the kidney effects in male rats reported [under TSCA Section 8(e)] by ARCO (8EHQ-1281-0422) on studies performed by the American Petroleum Institute on a reference unleaded gasoline." According to the draft final report from the API's 2-year inhalation study of unleaded gasoline, kidney tumors (renal carcinomas) were found in male rats at all dose levels tested (i.e., 67, 292, and 2056 ppm). Similar lesions in female rats were reportedly not observed in the study.

Submission Evaluation

Although the Standard Oil Company (Indiana) submission does not indicate the actual in-chamber test substance concentrations (the tested concentrations reported are assumed to be estimated or "target" levels), the provided information does indicate that the observed nephrotoxic effect in male rats is real, in that the observed adverse effect is both reproducible and dose-related. Although the numbers of affected animals were reported in the submission, neither the extent nor the severity of the renal proximal tubule degeneration/necrosis or the extent of regeneration were indicated. In addition, the reportedly "questionable" results of the 21-day inhalation study of light straight run naphtha may not necessarily be that questionable, but may actually tend to increase concern. The concern is due to the reported observation of male-specific kidney toxicity despite the presence of respiratory problems. Such problems would imply less than normal alveolar ventilation resulting in lower than expected doses. In general, all of the reported observations of degeneration, necrosis, and regeneration should become more clear when EPA receives complete copies of the final reports containing the actual protocols and data obtained from the performed studies.

It should be noted that the dramatically greater sensitivity of the male rat kidney to certain chemical substances is not a new finding. As the submitter pointed out, Isopar C (which is a light alkylate naphtha) is known to cause adverse kidney effects in male but not female rats. In addition, other chemical substances (e.g., carbon tetrachloride, dicyclopentadiene, methyldicyclopentadiene dimer, medium aliphatic solvent naphtha) have also been reported (under TSCA Section 8(e) for the latter three substances) to cause male-specific kidney toxicity in rats.

With regard to the submitter's speculation that the male-specific kidney toxicity observed with exposure to certain of the tested naphtha streams/blends might be related to the findings in the API's chronic inhalation study of unleaded gasoline, it should be noted that the Discussion and Conclusion section in the draft final report of the latter study contains the following statement:

> "Renal carcinomas were found in male rats at all three [unleaded gasoline] exposure levels. Similar lesions were not observed in the female rats. Simple explanations for this difference, e.g., lower minute ventilation rates for females than males, are probably not adequate since the response was observed over a large concentration range. More probably, the difference is due to a more fundamental difference between male and female rats."

In light of the previous statement, additional studies could be conducted to examine the kidney effects of known male(rat)-specific kidney toxicants in castrated or estrogen-treated male and ovarectomized or androgen-treated female rats. The results of such studies may help to clarify the observed male-specific kidney toxicity in rats exposed to certain chemical substances.

Current Production and Use

A review of the production range (includes importation volumes) statistics for the CAS Registry Numbers 64741-64-6, 64741-46-4, and 64741-55-5 (which are listed in the initial TSCA Inventory) shows that in excess of 26, 64, and 64 billion pounds, respectively, were reported as produced/imported in 1977. **/

The following definitions for the subject refinery streams were obtained from the initial TSCA Chemical Substance Inventory:

Naphtha (petroleum), full range alkylate (CAS# 64741-64-6)

A complex combination of hydrocarbons produced by distillation of the reaction products of isobutane and monoolefinic hydrocarbons usually ranging in carbon number from C3 through C6. It consists of predominantly branched chain saturated hydrocarbons having carbon numbers predominantly in the range of C7 through C12 and boiling in the range of approximately 90°C to 220°C (194°F to 428°F).

Naphtha (petroleum), light straight-run (CAS# 64741-46-4)

A complex combination of hydrocarbons produced by distillation of crude oil. It consists predominantly of aliphatic hydrocarbons having carbon numbers predominantly in the range of C4 through C10 and boiling in the range of approximately -20°C to 180°C (-4°F to 356°F).

Naphtha (petroleum), light catalytic cracked (CAS# 64741-55-5)

A complex combination of hydrocarbons produced by the distillation of products from a catalytic cracking process. It consists of hydrocarbons having carbon numbers predominantly in the range of C4 through C11 and boiling in the range of approximately -20°C to 190°C (-4°F to 374°F). It contains a relatively large proportion of unsaturated hydrocarbons.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Comments/Recommendations

In its submission, the Standard Oil Company (Indiana) reported its intention to request the American Petroleum Institute (API) to pursue the preliminary findings of adverse kidney effects in male rats. In addition, the company reported that due to the unreliable results obtained in the 21-day inhalation study of the light straight run naphtha, another study is scheduled and that the results, when available, would be provided to the Agency.

The Agency has received and evaluated an American Petroleum Institute "For Your Information" submission (FYI-OTS-0382-0171 et seq.) containing final results from several acute *in vivo* toxicity studies and preliminary results from an *in vivo* chronic toxicity study of light catalytic cracked petroleum naphtha (CAS No. 64741-55-5). The Agency has also received and reviewed many other TSCA Section 8(e) and "FYI" submissions which have contained both toxicity and/or exposure information on a variety of synthetic fuel and petroleum process streams.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Standard Oil Company (Indiana) to provide, when available, complete copies of the final reports including the test protocols and data from each of the *in vivo* inhalation studies cited in its submission. *In addition*, the company will be requested to describe the actions it has taken or plans to take on a voluntary basis in response to the submitted data to warn workers and others and to reduce or eliminate exposure to the subject naptha streams.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to OSHA, NIOSH, CPSC, DOE, NCI/NTP, ORD/EPA, OANR/EPA, OW/EPA, OSWER/EPA, the OTS Synfuels Workgroup, and the EPA Alternate Fuels Workgroup. In addition, a copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: JUN 28 1982

SUBJECT: Status Report* 8EHQ-0682-0447

Approved 6/29

Revision Needed

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Sun Refining and Marketing Company provided the following summarized final results from a chronic mouse skin-painting study of 60 SUS @ 100°F viscosity grade light naphthenic distillate (CAS No. 64741-52-2). The test material was reported to have been applied at doses of 30 milligrams, three times per week for 2 years to 25 male and 25 female Charles River CD-1 mice.

		60 SUS @ 100° F VISC. GRADE LIGHT NAPHTHENIC DISTILLATE	USP WHITE MINERAL OIL
Epidermal Hyperplasia			
	Grade 1	7 of 50 (14%)	2 of 50 (4%)
	Grade 2	3 of 50 (6%)	
Epidermal Dysplasia			
	Grade 2	1 of 50 (2%)	
		11 of 50 (22%)	2 of 50 (4%)

According to the submitter, the obtained results indicate that the tested distillate induced a statistically significant increase in benign epidermal tumors when compared to USP white mineral oil (control).

(NOTE: In a previous TSCA Section 8(e) submission (8EHQ-0278-0044), the Sun Petroleum Products Company (now a part of the Sun Refining and Marketing Company) reported that an extended 100°F naphthenic oil product (a blend of four (4) petroleum distillate streams) displayed tumorigenic activity (i.e., produced skin tumors) in mice following chronic dermal application. The 60 SUS @ 100°F viscosity grade light naphthenic distillate which is the subject of the present 8(e) submission was reported in 8(e) submission 8EHQ-0278-0044 to be one of the four petroleum distillate streams in the tested extended oil product).

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

Based on the provided summarized information, it is unclear as to the relationship which exists between the reported gradations of epidermal hyperplasia/dysplasia and the reported induction of a statistically significant level of benign skin tumors. This may be clarified when the Agency receives a complete copy of the final report including protocols and data from the chronic skin-painting study.

Current Production and Use

A review of the production range (includes importation volumes) statistics for light naphthenic petroleum distillates (CAS No. 64741-52-2), as listed in the initial TSCA Inventory, has shown that over 4.3 billion pounds were reported as produced/imported in 1977. This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

The following definition for the subject petroleum distillate was obtained from the initial TSCA Chemical Substances Inventory:

Distillates (petroleum), light naphthenic (CAS# 64741-52-2)

> A complex combination of hydrocarbons produced by vacuum distillation of the residuum from atmospheric distillation of crude oil. It consists of hydrocarbons having carbon numbers predominantly in the range of C15 through C30 and produces a finished oil with a viscosity of less than 100 SUS at 100°F (19cSt at 40°C). It contains relatively few normal paraffins.

Comments/Recommendations

The Sun Refining and Marketing Company reported that its employees had been notified of the "potential skin hazards associated with prolonged or repeated contact with this oil and have attended educational sessions informing them how to protect themselves when handling this oil." In addition, the submitting company reported that it was eliminating 60 SUS @ 100°F viscosity grade light naphthenic distillate from its product line. It should also be noted that the Sun Petroleum Products Company reported (in TSCA Section 8(e) submission 8EHQ-0278-0044) that the tested extended oil product had been discontinued.

The Agency has received and reviewed many other TSCA Section 8(e) and "For Your Information (FYI)" submissions which have contained toxicity and/or exposure data on a variety of coal, shale, and petroleum crude and distillate streams.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Sun Refining and Marketing Company to provide a complete copy of the final report including protocols and data from its chronic mouse skin-painting study of 60 SUS @ 100°F viscosity grade light naphthenic distillate.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to OSHA, NIOSH, CPSC, NCI/NTP, DOE, ORD/EPA, OANR/EPA, OW/EPA, OSWER/EPA, the OTS Synfuels Workgroup, and the EPA Alternative Fuels Workgroup. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0682-0448 S

Page 1 of 3

DATE: JUL 30 1982

SUBJECT: Status Report* 8EHQ-0682-0448 S

Approved 8/3

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The GAF Corporation submitted summarized results from several short-term in vitro assays of 1-(2-hydroxyethyl)-2-pyrrolidinone (CAS No. 3445-11-2). According to the submitter, the subject compound demonstrated a positive mutagenic response in an Ames test, a suggestive mutagenic response in a Chinese Hamster Ovary (CHO)/HGPRT Gene Mutation assay, and negative responses in CHO/Sister Chromatid Exchange (SCE), CHO/Chromosomal Aberration, and Balb/c-3T3 (mouse) Cell Transformation assays. With regard to acute in vivo toxicity, the company reported that the chemical shows "a very low potential for acute effects" as evidenced by an acute oral LD50 (rats) of greater than 14 g/kg, negative results obtained from primary rabbit skin irritation and guinea pig sensitization studies, and observed mild conjunctivitis (clearing on the second day) in a primary rabbit eye irritation study.

Submission Evaluation

1-(2-Hydroxyethyl)-2-pyrrolidinone was tested for reverse mutation in the Ames (Salmonella typhimurium (bacteria)) test; for specific locus mutation, sister chromatid exchange, and chromosomal aberrations in cultured Chinese hamster ovary (CHO) cells; and for neoplastic transformation in cultured mouse cells.

According to the provided summarized information, 1-(2-hydroxyethyl)-2-pyrrolidinone gave a positive response in the Ames test and the activity was reduced by purification of the chemical. However, because test data and protocols were not provided for review, the validity of the latter interpretation is open to question.

Although the results obtained from the CHO specific locus mutation and sister chromatid exchange assays could be considered as suggestive of positive, no conclusions can be drawn without a review of the actual test data and protocols. In addition, there was no indication in the submission that either of these assays were performed in the presence of metabolic activation. Before any statement can be made about the chemical's activity or lack thereof, it would be essential to review data from these assays performed in the presence and absence of exogenous metabolic activation.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

The submitter stated that 1-(2-hydroxyethyl)-2-pyrrolidinone did not induce chromosome aberrations in CHO cells and did not induce neoplastic transformation in Balb/c-3T3 (mouse) cells. However, no data were submitted to support this claim nor was there any evidence presented in the submission that these assays were conducted in the presence of metabolic activation. Again, it would be necessary to perform these particular studies both in the absence and presence of metabolic activation. Therefore, in the absence of data and information on the protocols used to test 1-(2-hydroxyethyl)-2-pyrrolidinone, no conclusions can be drawn about this chemical's ability to induce chromosomal aberrations in cultured Chinese hamster ovary cells or its ability to induce neoplastic transformation of cultured mouse cells.

Current Production and Use

A review of the production range (includes importation volumes) statistics for 1-(2-hydroxyethyl)-2-pyrrolidinone (CAS No. 3445-11-2), which is listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all the production range data reported were claimed as confidential by the manufacturer(s)/importer(s) and cannot be disclosed. (See Section 14(a) of TSCA, U.S.C. 2613 (a)). **/

Although the GAF Corporation did not provide any information concerning the uses of the subject chemical substance, the company did report that because most of the uses of 1-(2-hydroxyethyl)-2-pyrrolidinone are still being developed to full potential, the field volume of the chemical is low and its use is being directed by technically qualified people. No information on the use(s) of 1-(2-hydroxyethyl)-2-pyrrolidinone was located in the secondary literature sources consulted.

Comments/Recommendations

Although a positive *in vitro* test result, when considered alone, may not be sufficient to offer reasonable support for a conclusion of substantial risk, EPA believes that *in vitro* studies do provide valuable data that can aid in assessing possible risks posed by chemicals to health and the environment. EPA also believes that positive *in vitro* test results in combination with additional information (e.g., knowledge of exposure to or high

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**/The data submitted for the initial TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

production of the chemical substance or mixture) would in many cases suggest the need for further, more definitive toxicologic study and the results considered for possible submission to EPA pursuant to Section 8(e) of TSCA.

The GAF Corporation stated that the company is evaluating its worker safety practices in the light of the submitted data in order to assure continued compliance with the best current practices. The company also reported that it plans to update its literature and inform its customers of the submitted information.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the GAF Corporation to provide complete copies of the final reports including protocols and data from all of the in vitro studies on 1-(2-hydroxyethyl)-2-pyrrolidinone which were cited in its submission. In view of EPA's general interest in company actions that are taken on a voluntary basis in response to chemical toxicity/exposure information, CHIB will ask the GAF Corporation if it is conducting, or plans to conduct, additional studies designed to further define the toxicity of 1-(2-hydroxyethyl)-2-pyrrolidinone.

b) The Chemical Hazard Identification Branch will screen the submitted information on 1-(2-hydroxyethyl)-2-pyrrolidinone to determine the need for further assessment.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, ORD/EPA, OW/EPA, and OSWER/EPA. In addition, a copy of the status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0682-0449 S
Page 1 of 3

DATE: [illegible] 15 1982

SUBJECT: Status Report* 8EHQ-0682-0449 S

Approved 7/19

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

Buckman Labortories, Inc. reported that 1,4-dioxane (CAS No. 123-91-1) had been detected by gas chromatography-mass spectroscopy in technical grade dichloroethyl ether (DCEE; CAS No. 111-44-4). The submitter stated that the amounts of 1,4-dioxane found in two separate lots of DCEE were 0.42 percent and 0.55 percent.

Submission Evaluation

In 1976, the International Agency for Research on Cancer (IARC) concluded (IARC Mongraph, Vol. 11, 1976) that 1,4-dioxane was "carcinogenic in rats and guinea pigs" via oral administration in that the compound "produced malignant tumors of the nasal cavity and liver in rats and tumors of the liver and gall bladder in guinea pigs." IARC also stated that 1,4-dioxane was "active as a promoter" in a 2-stage mouse skin carcinogenicity study but was not found to be carcinogenic in an inhalation study in rats. Based on the results of a bioassay (DHEW (NIH) Publication No. 78-1330), the National Cancer Institute (NCI) concluded that 1,4-dioxane, administered via the drinking water, "induced hepatocellular adenomas in female Osborne-Mendel rats." From the same study, NCI also concluded that the compound "was carcinogenic in both sexes of rats, producing squamous cell carcinomas of the nasal turbinates, and in both sexes of B6C3F1 mice, producing hepatocellular carcinomas." In addition, like many polyethylene glycols, 1,4-dioxane (an anhydride of diethylene glycol) can produce toxic effects in the kidney and liver (in humans). A characteristic nephrosis of the kidney tubules (hydropic degeneration) with associated liver cell necrosis can occur regardless of the route of 1,4-dioxane exposure (i.e., via inhalation, oral ingestion, and/or skin application).

It should also be noted that an evaluation of data on dichloroethyl ether (which is structurally related to the known carcinogen bis(chloromethyl)ether) was conducted by the International Agency for Research on Cancer (IARC Monograph, Vol. 9, 1975).

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

According to IARC, orally administered dichloroethyl ether "produced an increased incidence of liver-cell tumours in male mice of two strains" and subcutaneously injected dichloroethyl ether "produced a low incidence of sarcomas at the injection site." In addition, it is known that dichloroethyl ether and its vapors are highly irritating to skin, eyes, and mucous membranes; acutely toxic amounts of dichloroethyl ether have been shown to penetrate rabbit skin.

With regard to the present submission, it should be noted that the possibility exists that there may be some degree of synergism or antagonism between DCEE and 1,4-dioxane which may affect the ultimate oncogenic (or other toxic) activity of the two chemicals in combination.

Current Production and Use

A review of the production range (includes importation volumes) statistics for dichloroethyl ether (CAS No. 111-14-4), which is listed in the initial TSCA Inventory, has shown that between 2.4 million and 24 million pounds of this chemical were reported as produced/imported in 1977. **/

Dichloroethyl ether is a general solvent used in high grade lubricating oils; textile scouring and cleaning; organic syntheses; paints, varnishes, lacquers, and finish removers; and as a soil fumigant.

A review of the production range (includes importation volumes) statistics for 1,4-dioxane (CAS No. 123-91-1), which is listed in the initial TSCA Inventory has shown that between 2 million and 15 million pounds of this chemical were reported as produced/imported in 1977. **/

The main use of 1,4-dioxane is as a stabilizer in chlorinated solvents. The chemical is also used as a solvent for cellulose acetate, ethyl and benzyl cellulose, resins, oils, waxes, and certain dyes; as a solvent for electrical, agricultural, and biochemical intermediates, and as a solvent for adhesives, sealants, cosmetics, pharmaceuticals, rubber chemicals, and surface coatings.

**/This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Comments/Recommendations

Buckman Laboratories, Inc. reported that its employees and customers were being notified of the presence of 1,4-dioxane in dichloroethyl ether. In addition, the company reported that its current safety precautions include "body-protective clothing and boots, eye protection, and monitoring of air levels of dichloroethyl ether."

In 1974, the Occupational Safety and Health Administration (OSHA) set the current occupational standard for exposure to dichloroethyl ether at ceiling level of 15 ppm and established the current occupational standard for 1,4-dioxane exposure at an 8-hour time-weighted average (TWA) of 100 ppm in air (39 CFR 23540). In 1977, the National Institute for Occupational Safety and Health (NIOSH) recommended that the occupational exposure to 1,4-dioxane be controlled so that workers are not exposed at airborne concentrations greater than 1 ppm based on a 30-minute sampling period (DHEW (NIOSH) Publication No. 77-226).

EPA has received and evaluated several other TSCA Section 8(e) submissions concerning 1,4-dioxane contamination (8EHQ-1179-0320 et seq., Sherex Chemical Company; 8EHQ-0979-0326 S et seq., Shell Oil Company; 8EHQ-0280-0331 S et seq./8EHQ-0380-0336 S et seq., Henkel Corporation). In addition, the Chemical Hazard Identification Branch (CHIB/AD/EPA) has prepared a Chemical Hazard Information Profile (CHIP) on 1,4-dioxane.

a) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, OW/EPA, OSWER/EPA, OANR/EPA, and ORD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: JUL 30 1982

SUBJECT: Status Report* 8EHQ-0682-0450

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Approved 8/10

Revision Needed ____

Submission Description

The Tennessee Eastman Company, a Division of the Eastman Kodak Company, submitted summarized results extracted from a draft paper entitled, "Comparative Inhalation Teratogenicity of Three Glycol Ether Solvents in Rats" (B.K. Nelson et al.; National Institute for Occupational Safety and Health (NIOSH)). The submitting company stated that its TSCA 8(e) notification pertains to 2-ethoxyethanol acetate (CAS No. 111-15-9), referred to in the submission as 2-ethoxyethyl acetate, and that Eastman manufactures and markets this chemical under the trade name EKTASOLVE® EE Acetate Solvent.

The following summary was provided by the Tennessee Eastman Company:

> "Pregnant rats were exposed to 2-ethoxyethyl acetate at 130, 390, or 600 ppm, 7 hours/day, on gestation days 7-15, and were sacrificed on day 20. At 600 ppm, there was total embryo lethality. At 390 ppm, there was increased embryo lethality, fetotoxicity as shown by reduced fetal weight, and several cardiac malformations. At 130 ppm, one fetus had a cardiac malformation which was of the same type as one of those observed at 390 ppm. Cardiac malformations rarely occur spontaneously and none were observed in control fetuses. In addition, the incidence of visceral and skeletal variations was increased in exposed groups compared to controls."

The Tennessee Eastman Company also provided information on the physical and chemical properties of EKTASOLVE® EE Acetate Solvent, as well as current production and employee exposure data.

Submission Evaluation

The submitted summarized results indicate that 2-ethoxyethanol acetate is teratogenic in rats dosed via inhalation for 7 hours/

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

day with 600, 390 or 130 ppm of the chemical on gestation days 7-15. The author of the paper (B.K. Nelson of NIOSH), stated in a telephone conversation on July 15, 1982, that no maternal toxicity was apparent in this study at any dose level. However, the author also stated that although animal weight data had been collected, statistical analysis of these data had not yet been performed. Because there was total embryo loss reported at 600 ppm, weight data for this dose group may not reflect maternal toxicity. Embryo/fetal toxicity, including cardiac malformations, occurred at 390 ppm, while one cardiac malformation occurred at 130 ppm. This dose level (130 ppm) is probably close to the no-observed-effect level in rats.

Although the current OSHA standard for 2-ethoxyethanol acetate is 100 ppm as an 8-hour time-weighted average (TWA), the submitting company stated that it has recommended a maximum workplace exposure level of 5 ppm (TWA).

An additional consideration in the evaluation of 2-ethoxyethanol acetate toxicity is the teratogenic potential of 2-ethoxyethanol, a hydrolysis product of 2-ethoxyethanol acetate. Hydrolysis could occur in the mucosa of the gastrointestinal tract and from esterases in the liver and red blood cells.

Current Production and Use

A review of the production range (includes importation volumes) statistics for 2-ethoxyethanol acetate (CAS No. 111-15-9), which is listed in the initial TSCA Inventory, has shown that between 20 million and 100 million pounds of this chemical were reported as produced/imported in 1977. [**]

The Tennessee Eastman Company stated that 2-ethoxyethanol acetate is currently manufactured in closed systems at two of its plant sites, with a combined approximate annual production of 60 million pounds involving 90 employees. According to the submitter, approximately 225 thousand pounds of 2-ethoxyethanol acetate are handled at a third site in semiclosed or open systems by eight employees who may experience brief, limited exposures. The submitter also reported that the Photographic Division of the Eastman Kodak Company handles approximately 66 thousand pounds of 2-ethoxyethanol acetate annually in the formulation of its photoresist products and for laboratory use. According to the submitter, 12 employees are involved in these operations and exposures are limited.

[**] This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

According to secondary literature sources, the major uses of 2-ethoxyethanol acetate include: a blush retardant in lacquers; a solvent for oils, nitrocellulose, and resins; a component of wood stains and varnish removers; and an ingredient in products for the treatment of textiles and leather.

Comments/Recommendations

The Tennessee Eastman Company stated that it was notifying its customers and employees of the 2-ethoxyethanol acetate toxicity findings from the cited NIOSH study and provided the Agency with a copy of its revised Material Safety Data Sheet on EKTASOLVE® EE Acetate Solvent. The company also stated that product labels would be revised as soon as possible to reflect the new toxicity findings. As previously mentioned, Eastman stated that it has established a company industrial hygiene guideline for EKTASOLVE® EE Acetate Solvent of 5 ppm as an 8-hour time-weighted average (TWA). The company also reported that the Chemical Manufacturers Association plans a teratology study to begin in mid-1982 and to be complete by mid-1983.

The Chemical Hazard Identification Branch (CHIB/AD/EPA) has prepared Chemical Hazard Information Profiles (CHIP's) on 2-ethoxyethanol acetate and 2-ethoxyethanol. The Office of Toxic Substances (OTS/OPTS/EPA) is currently conducting a detailed assessment of 2-ethoxyethanol.

a) The Chemical Hazard Identification Branch will request a complete copy of the final report entitled "Comparative Inhalation Teratogenicity of Three Glycol Ether Solvents in Rats" directly from NIOSH in order to more completely evaluate the findings reported by the Tennessee Eastman Company. The requested report and its evaluation will be considered during the review of the CHIP on 2-ethoxyethanol acetate.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, OW/EPA, OANR/EPA, HERD/OTS/EPA, TRDB/AD/EPA and to the "Solvents Workgroup" of the EPA Toxic Substances Priorities Committee (TSPC). CHIB will also provide a copy of this status report to the Industry Assistance Office (IAO/OTS/EPA) and to the Office of Toxics Integration (OTI/OPTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0682-0451
Page 1 of 3

DATE: JUL 16 1982

SUBJECT: Status Report* 8EHQ-0682-0451

Approved 7/22

Revision Needed

FROM: Justine L. Welch, JW Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

Borg-Warner Chemicals, Inc. reported that it had been verbally informed by a laboratory in England that triphenyl phosphite (CAS No. 101-02-0), dermally applied at doses of 500 and 5,000 mg/kg, had been found to produce neurotoxic effects in chickens. The company also reported that no effects had been observed thus far at the 50 mg/kg dose level. According to the submitter, Tenneco Chemicals, Synthetic Products Company, and Borg-Warner Chemicals, Inc. are co-sponsors of the subject study.

In its submission, Borg-Warner stated that "it has been known for many years and reported in the open literature that triphenyl phosphite can produce neurotoxic effects in animals when taken orally" and cited the following reference: "The Pharmacologic Action of the Phosphorous Acid Esters of the Phenols", M. Smith et al., J. Pharmacol. Exp. Ther., Vol. 49, 78-99 (1933).

In addition, Borg-Warner Chemicals, Inc. stated that the company has "never observed any neurotoxic effects in ...[its employees at its manufacturing] plant that could be attributed to triphenyl phosphite" and also stated that the company has never received information from customers claiming human neurotoxic effects due to exposure to the chemical.

Submission Evaluation

Many organophosphorous chemicals (e.g., certain aryl phosphates) are known to be absorbed dermally and pose a risk of neurotoxicity via that route of exposure. As reported by the submitter (and as demonstrated by Smith et al. (1933)), triphenyl phosphite is neurotoxic. The known symptoms of triphenyl phosphite neurotoxicity consist of early onset motor signs of acetylcholinesterase inhibition and delayed onset motor signs of neurotoxic target protein (formerly referred to as neurotoxic esterase (NTE)) inhibition accompanied by axonal degeneration in both peripheral and central neurons. While Smith et al. observed these types of effects in chickens exposed to triphenyl phosphite via the oral route, these effects were also seen in rats and cats following subcutaneous injection of the chemical.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

In general, dermal exposure of hens to organophosphorus chemicals is usually accomplished by application of the test substance to the comb or to a patch of skin under the wing. Knowledge of the relationship between the dermally applied doses/effects and orally administered doses/effects would help to estimate the degree of the dermal absorption and also help to evaluate the relative hazard/risk of dermal versus oral exposure to triphenyl phosphite. Although the duration of the ongoing study was not reported, it is speculated that study most probably involves acute or subacute dermal exposure. It should also be noted that a 90-day delayed neurotoxicity study in hens would be appropriate for establishing a no-observed-effect-level (NOEL) for the compound.

Current Production and Use

A review of the production range (includes importation volumes) statistics for triphenyl phosphite (CAS No. 101-02-0), which is listed in the initial TSCA Inventory, has shown that between 10 million and 51 million pounds of this chemical were reported as produced/imported in 1977. **/

Borg-Warner Chemicals, Inc. reported that it is the major U.S. manufacturer of triphenyl phosphite and that the company has produced the chemical since 1959. The submitter also reported that the major use of triphenyl phosphite is as a stabilizer in plastics. According to secondary literature sources, triphenyl phosphite is also used as a chemical intermediate, a diluent for epoxy resins, and as a metal scavenger.

Comments/Recommendations

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request Borg-Warner Chemicals, Inc. to provide a complete copy of the final report, including test protocols and data, from the co-sponsored neurotoxicity study of triphenyl phosphite. In addition, Borg-Warner will be requested to clarify its statement that no neurotoxic effects that could be attributed to triphenyl phosphite had been observed in company employees.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

b) In light of EPA's general interest in company actions that are taken on a voluntary basis in response to submitted information, each of the study co-sponsors will be requested to describe their actions taken to warn workers and others, and to reduce and/or eliminate exposure to triphenyl phosphite. In addition, the co-sponsors will be asked if they are conducting or plan to conduct other studies designed to further define the neurotoxic potential of triphenyl phosphite.

c) The Chemical Hazard Identification Branch will consider the preparation of a Chemical Hazard Information Profile (CHIP) on triphenyl phosphite.

d) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, OW/-EPA, OSWER/EPA, ORD/EPA and TRDB/AD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0882-0452
Page 1 of 3

DATE: AUG 31 1982

SUBJECT: Status Report* 8EHQ-0882-0452

Approved 9/8/82

Revision Needed

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Eastman Kodak Company provided the following summarized results from a 14-day feeding study of 4-chloro-3-nitroaniline (CAS No. 635-22-3) in rats:

> "Four groups of five male Sprague-Dawley rats were fed ground feed containing 1% corn oil and 1%, 0.1%, 0.01%, and 0% 4-chloro-3-nitroaniline. Dosage rates were calculated as 698, 87, 8.7 or 0 mg/kg/day, respectively, for 14 days. There was a severe decrease in the absolute and relative weights of the testes for rats in the 1% dose group. Histopathology revealed severely degenerated sperm in the testes and epididymides and moderate atrophy of the seminiferous epithelium with minimal presence of multinucleated giant cells. A single small area of clear cells observed in the liver of a single rat may or may not be compound related since similar changes are observed in unexposed older rats. These effects were not observed for animals in the control group or in the 0.1% or 0.01% dose groups."

In submitting this information to EPA, the Eastman Kodak Company stated that no data were found in the literature that describe the reported toxic effects for 4-chloro-3-nitroaniline. The company did point out, however, that Bond et al. (Fundamental and Applied Toxicology 1:389-394, 1981) observed similar lesions in Fischer 344 male rats following single 200, 300, or 450 mg/kg oral doses of nitrobenzene in corn oil. The lesions observed by Bond et al. were characterized as "necrosis of spermatogenic cells and the presence of multinucleated giant cells in the testes with the replacement of spermatozoa in the epididymides with necrotic debris."

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

Although a complete evaluation of the seriousness of the reported testicular toxicity is not possible due to the summary nature of the submitted information, the provided data do indicate that the observed adverse effects may be reversible. However, it should be noted that because the study was not carried out for a full spermatogenic cycle in the rat (60 to 70 days), it is possible that more chronic testicular effects would not be reversible.

In view of the fact that the only other reported pathologic effect was a small area of clear cells in the liver of a single rat exposed to the chemical, it may be that the observed testicular effects are among the more sensitive indicators of exposure to 4-chloro-3-nitroaniline.

Current Production and Use

A review of the production range (includes importation volumes) statistics for 4-chloro-3-nitroaniline (CAS No. 635-22-3), which is listed in the initial TSCA Inventory, has shown that between 100 thousand and 1 million pounds of this chemical were reported as produced/imported in 1977. **/

With regard to its own production and use of 4-chloro-3-nitroaniline, Eastman Kodak stated that the chemical is manufactured by the Tennessee Eastman Company and shipped to the Arkansas Eastman Company where the compound is used solely as a reaction intermediate. According to the submitter, 4-chloro-3-nitroaniline is insoluble in water and release to the environment is "minimal to non-existent." In addition, Eastman Kodak reported that the chemical is always handled as a "water wet solid" and that the maximum air concentration is expected to be "less than 1 mg/m^3." The Eastman Kodak Company also reported that although it does not presently sell 4-chloro-3-nitroaniline, the chemical may be sold in the future.

According to secondary literature sources, 4-chloro-3-nitroaniline is used as an intermediate in the manufacture of certain azo dyes, pharmaceuticals, and other organic chemicals.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Comments and Recommendations

In its submission, Eastman Kodak stated that the company had taken the following actions in response to the reported toxicity data: 1) company personnel handling 4-chloro-3-nitroaniline were notified of the laboratory findings; 2) handling procedures were reviewed to assure maximum safety in working with the chemical; and 3) the product label for the chemical was updated to incorporate the new toxicologic findings.

The Test Rules Development Branch (TRDB/AD/EPA) is currently evaluating available toxicity/exposure data on 4-chloro-3-nitroaniline as it pertains to the Interagency Testing Committee (ITC)-designated class of aniline and halogen/nitro-substituted anilines (44 FR 31866). In addition, 4-chloro-3-nitroaniline is listed in the EPA's June 22, 1982 TSCA Section 8(a) chemical exposure information-gathering final rule (47 FR 26992).

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will screen the information contained in both the initial submission and the recently received final report from the 14-day feeding study of 4-chloro-3-nitroaniline in rats (8EHQ-0882-0452 Supplement).

b) In view of the Agency's general interest in company actions that are taken on a voluntary basis in response to submitted chemical toxicity/exposure information, the Eastman Kodak Company will be asked if it is conducting, or plans to conduct, additional studies designed to further define the toxicity of 4-chloro-3-nitroaniline.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, ORD/EPA, OW/EPA, OSWER/EPA, and TRDB/AD/EPA. A copy of the status report will also be provided to the Industry Assistance Office (IAO/OTS/EPA) and to the Office of Toxics Integration (OTI/OPTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0882-0453
Page 1 of 3

DATE: AUG 31 1982

SUBJECT: Status Report* 8EHQ-0882-0453

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Approved 9/8/82

Revision Needed ______

Submission Description

The Union Carbide Corporation reported that the company had received a preliminary and limited oral report from scientific staff of the National Institute for Occupational Safety and Health (NIOSH) concerning the incidence of gliomas in male rats chronically exposed via inhalation to ethylene oxide (ETO; CAS No. 75-21-8). According to Union Carbide, the following glioma incidence data from the study were furnished by NIOSH:

Group	Gliomas/Male Rats
0 (Control)	0/38
50 ppm ETO	2/77
100 ppm ETO	5/79

According to NIOSH, the subject study involved Fischer 344 male rats exposed to ETO via inhalation at the above doses for 7 hours/day, 5 days/week for 24 months. Further, NIOSH indicated that a full final report (which is expected to be released in early 1983) would be provided to EPA.

In its submission, Union Carbide reported that the company had also submitted the glioma incidence data to EPA's Office of Pesticide Programs pursuant to the Section 6(a)(2) and Rebuttable Presumption Against Registration (RPAR) provisions of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). In providing this information to EPA, Union Carbide stated that neither the biological nor statistical validity of the subject data had been determined.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Submission Evaluation

Although the oncogenicity data contained in the present submission are both preliminary and limited in nature, there does appear to be a relationship between the level of ethylene oxide exposure and the glioma incidence. It should be noted that gliomas, which are tumors of the supporting structures of nervous tissue, are not considered common tumors in Fischer 344 rats. Further evaluation of the submitted (and other) findings should be possible when the full final report is released by NIOSH in early 1983.

In general, human and animal exposure to ethylene oxide can result in irritation to eyes, skin, and respiratory tract, central nervous system (CNS) depression, and possibly peripheral neuropathy. Degenerative changes in the lungs, liver, and kidneys of animals have been observed following acute exposures to ETO at high concentrations. Adverse reproductive system effects due to ETO exposure have been detected in rats (embryo/fetotoxicity), mice (teratogenicity), and humans (decreased sperm counts). Ethylene oxide has been shown to be mutagenic in in vitro and in vivo studies. The chemical has also been found to induce clastogenic effects (chromosomal aberrations) and increased numbers of Sister Chromatid Exchanges (SCEs) in peripheral lymphocytes in both humans and animals. In addition, ethylene oxide has been found to be carcinogenic via inhalation in rats causing peritoneal mesotheliomas and mononuclear cell leukemia and via subcutaneous injection in mice causing injection-site sarcomas.

Current Production and Use

A review of the production range (includes importation volumes) statistics for ethylene oxide (CAS No. 75-21-8), which is listed in the initial TSCA Inventory, has shown that between 1.46 billion and 5.36 billion pounds of this chemical were reported as produced/imported in 1977. This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

According to the July 5, 1982 issue of Chemical & Engineering News, annual U.S. ethylene oxide production is expected to remain stable at approximately 5.2 billion pounds until at least 1983.

The major use of ethylene oxide is as an intermediate in the production of ethylene glycol, acrylonitrile, ethanolamine, glycol ether, and non-ionic surfactants. The chemical is also used as a sterilant and fumigant.

Comments/Recommendations

In 1974, the Occupational Safety and Health Administration (OSHA) set the current occupational standard for ethylene oxide exposure at an 8 hour time-weighted average (TWA) of 50 ppm in air (39 CFR 23540). In 1977, the National Institute for Occupational Safety Health (NIOSH) prepared a Special Occupational Hazard Review with control recommendations for the use of ethylene oxide as a sterilant in medical facilities (DHEW (NIOSH) Publication No. 77-200). In that review NIOSH recommended (based on the results of tests for mutagenicity) that exposure be controlled so that workers would not be exposed to ethylene oxide at a concentration greater than 75 ppm (determined during a 15 minute sampling period) as a ceiling occupational exposure limit and with the provision that the TWA concentration limit of 50 ppm for a workday not be exceeded. Based primarily on the results of an industry-sponsored study showing ethylene oxide to be carcinogenic in rats, NIOSH further recommended (Current Intelligence Bulletin #35; May 22, 1981) that ethylene oxide be regarded in the workplace as a potential occupational carcinogen and recommended that appropriate controls be implemented to reduce worker exposure to the chemical. At present, the Occupational Safety and Health Administration (OSHA) is re-evaluating the existing current occupational health standard which regulates employee exposure to ethylene oxide. OSHA is currently reviewing comments received on its January 26, 1982, Advance Notice of Proposed Rulemaking for Occupational Exposure to Ethylene Oxide (ANPR; 47 FR 3566). In addition, the EPA's Office of Pesticide Programs (OPP/OPTS/EPA) is currently evaluating (via its RPAR process) toxicity/exposure data on ethylene oxide.

The EPA's Office of Toxic Substances (OTS/OPTS/EPA) has received and evaluated other TSCA Section 8(e) submissions on ethylene oxide (8EHQ-1078-0248 et seq. and 8EHQ-0979-0305 et seq.). In addition, OTS has received and reviewed two "For Your Information (FYI)" submissions on ethylene oxide (FYI-OTS-0280-0058 et seq. and FYI-OTS-0981-0123 et seq.). The Chemical Hazard Identification Branch (CHIB/AD/OTS/OPTS/EPA) has completed a draft Chemical Hazard Information Profile (CHIP) on ethylene oxide and the Test Rules Development Branch (TRDB/AD/OTS/OPTS/EPA) is currently evaluating toxicity/exposure data on alkyl epoxides as recommended by the Interagency Testing Committee (42 FR 55026). In addition, ethylene oxide is listed in the EPA's June 22, 1982, TSCA Section 8 (a) chemical exposure information-gathering final rule (47 FR 26992).

a) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, NCI/NTP, ORD/EPA, OW/EPA, OSWER/EPA, OANR/EPA, OPP/OPTS/-EPA, and TRDB/AD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0882-0454
Page 1 of 3

DATE: SEP 20 1982

SUBJECT: Status Report* 8EHQ-0882-0454

Approved 9/22

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Celanese Corporation submitted the final results of a chronic (lifetime) mouse skin-painting study of pentaerythritol triacrylate (PETA; CAS No. 3524-68-3) which was reported to contain varying amounts of pentaerythritol diacrylate (CAS No. 53417-29-1) and pentaerythritol tetraacrylate (CAS No. 4986-89-4).

According to Celanese, "the shaved backs of 50 mice were painted twice per week for 18 months with 50 mg of a 5% solution of the test chemical [PETA] in mineral oil. A positive control group of 50 mice was treated with benzo-a-pyrene. There were two control groups of 50 mice each. One of the control groups received no treatment; the other was painted with mineral oil only. Each was held for the duration of the experiment to observe background tumor rates. Six of 43 surviving animals in the test group developed lymphomas primarily of the spleen, compared to none of 48 animals in the "no treatment" control group and one of 49 animals in the mineral oil control group." Further, Celanese reported that the following conclusions were drawn from the results obtained from the performed study:

"1.) The incidence of lymphomas seen in animals treated with PETA is most likely treatment related.

2.) The data suggest the PETA is absorbed through the skin and may act as an internal carcinogen to lymphoid systems."

Submission Evaluation

The performed mouse skin-painting study results show that PETA causes slight dermal toxicity and can adversely affect several internal organ systems. Such results indicate absorption through the skin. Considering the slight dermal toxicity, however, it is impossible to determine whether intact skin serves as a barrier.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Following 18 months of twice weekly dermal PETA exposure, there was not only an increase in lymphomas of the spleen, but toxic effects in the kidney, including degeneration and pyelonephritis (not observed in the controls), adrenal inflammation, and prostatitis. There was also a number of cases of prostatic hyperplasia which did not correspond with those animals having prostatitis.

In addition, about 30% of the PETA-treated animals had atrophic gonads, compared with approximately 1-2% of the controls. Although the degree of gonadal atrophy was described as +1 to +2, the numbering system was not more specifically defined. With this percentage of animals affected, however, reproductive toxicity may be considered a possibility from extended exposure to the test material.

It should also be noted that there seems to be some discrepancy concerning the number of animals in the PETA-treated group. Although the submitter's cover letter referred to 43 survivors, Table 1 of the final report indicated that the final effective number was 35, whereas Table 5 listed 41 as the number of mice examined. No explanation for these differences was given in the submission.

Current Production and Use

A review of the production range (includes importation volumes) statistics for the subject chemicals, which are listed in the initial TSCA Inventory, has shown that the following ranges were reported for 1977: **/

Chemical Name	CAS No.	Approx. Prod./Import.
Pentaerythritol triacrylate	3524-68-3	$1X10^5$ to $1X10^6$ pounds
Pentaerythritol diacrylate	53417-29-1	$1X10^3$ to $1X10^4$ pounds
Pentaerythritol tetraacrylate	4986-89-4	$1X10^5$ to $1X10^6$ pounds

Although no specific information was provided by the Celanese Corporation concerning specific end-use(s) of PETA, it should be noted that the material is a reactive monomer. No specific end-use information for PETA was located in the secondary literature sources consulted.

**/ The above production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Comments/Recommendations

The Celanese Corporation reported that based on a review of its current recommended handling and industrial hygiene procedures, the company had concluded that those procedures afford adequate protection from PETA exposure. The recommended handling/industrial hygiene procedures reported by Celanese include avoiding eye and skin contact via the use of impervious gloves and overshoes, protective clothing, and chemical safety goggles. The Celanese Corporation also reported that copies of its submission had been sent to the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), and the National Cancer Institute (NCI).

The Agency has received and evaluated the following Section 8(e) submissions containing the results of chronic mouse skin-painting studies of compounds structurally related to pentaerythritol triacrylate: 8EHQ-0178-0028 et seq., neopentyl glycol diacrylate, Union Carbide Corporation; 8EHQ-0981-0410 et seq., triethylene glycol diacrylate, Celanese Corporation; and 8EHQ-0981-0411 et seq., tetraethylene glycol diacrylate, Celanese Corporation. The Chemical Hazard Identification Branch (CHIB/AD/OTS/EPA) has prepared a Chemical Hazard Information Profile (CHIP) on neopentyl glycol diacrylate and is currently considering the preparation of CHIPs on triethylene glycol diacrylate and tetraethylene glycol diacrylate.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Celanese Corporation to provide, if available, analytical data on the amount(s) of pentaerythritol diacrylate and pentaerythritol tetraacrylate typically found in PETA.

b) The Chemical Hazard Identification Branch will consider the preparation of a Chemical Hazard Information Profile (CHIP) on pentaerythritol di-, tri-, and tetraacrylate.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, NCI/NTP, OW/EPA, OSWER/EPA and ORD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0982-0455
Page 1 of 3

DATE: OCT 21 1982

SUBJECT: Status Report* 8EHQ-0982-0455

Approved ______

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Celanese Corporation submitted complete copies of the final reports from several short-term *in vitro* genetic screening assays of the following commercial dyes: Oil Yellow E190 (CAS No. 2481-94-9) and Solvent Red 19 (CAS No. 6368-72-5). According to Celanese, Oil Yellow E190 was found to be mutagenic in an Ames (bacteria) test in the presence of metabolic activation and in a mouse lymphoma cell test both with and without metabolic activation; Solvent Red 19 was reported to be active in the Ames and mouse lymphoma cell tests only in the presence of metabolic activation. In addition, Celanese reported that neither dye was found to be active in cultured mammalian cell transformation tests. In submitting these findings to EPA, Celanese stated that the company had "made no assessment of the risks presented by these dyes other than to determine their genotoxic potential."

Submission Evaluation

Oil Yellow E190 and Solvent Red 19 were tested for their ability to induce gene mutations in bacteria (*Salmonella typhimurium*) and mammalian cells in culture (mouse lymphoma L5178Y cells) and for their ability to induce morphologic transformation in Balb/c 3T3 mouse cells in culture.

Oil Yellow E190 induced gene mutations in *S. typhimurium* strains TA 98 and TA 100 when tested in the presence of an exogenous source of metabolic activation. In addition, a dose related increase in the number of revertant colonies was observed with strain TA 1538 in the presence of metabolic activation. Although the testing laboratory that performed this assay considered Oil Yellow E190 to be nonmutagenic for this particular strain because the induced mutation rate was not 3X background, this is an arbitrary designation of a positive response. A review of the data shows a dose related increase in revertant colonies which is judged to constitute a positive response in TA 1538.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

As reported, Solvent Red 19 did induce gene mutations in *S. typhimurium* strains TA 1538, TA 98 and TA 100 when tested in the presence of an exogenous source of metabolic activation.

In cultured mouse lymphoma L5178Y cells, Oil Yellow E190 induced gene mutations when tested both with and without metabolic activation, while Solvent Red 19 induced mutation in these cells only in the presence of an exogenous source of metabolic activation.

Although neither chemical induced morphologic transformation of cultured Balb/c 3T3 mouse cells, the assays were not conducted with metabolic activation. In the absence of such tests, no conclusions can be drawn about the ability of either Oil Yellow E190 or Solvent Red 19 to transform mammalian cells in culture.

It should be noted that in 1975, the International Agency for Research on Cancer (IARC) conducted an evaluation of the carcinogenic risk to humans from exposure to Solvent Red 19 (IARC Monograph; Volume 8; 1975). Although IARC found that the existing animal studies (performed via the oral route in rats) did not demonstrate a significant increase in tumor incidence, the studies were considered by IARC to be inadequate for evaluation.

It should also be noted that Oil Yellow E190 (N,N-diethyl-4-(phenylazo)benzenamine) is highly related structurally to the known potent rat liver carcinogen, N,N-dimethyl-4-(phenylazo)-benzenamine ("Butter Yellow"). Although the oral studies performed to date have not shown Oil Yellow E190 to possess tumorigenic activity toward the rat liver, further studies of more sophisticated design (e.g., using partially hepatectomized rats) would need to be conducted in order to remove a continuing suspicion that Oil Yellow E190 is also an oncogen.

Current Production and Use

A review of the production range (includes importation volumes) statistics for Oil Yellow E190 (CAS No. 2481-94-9), which is listed in the initial TSCA Inventory, has shown that between 1 thousand and 12 thousand pounds of this chemical were reported as produced/imported in 1977. **/ A review of the production range (includes importation volumes) statistics for Solvent Red 19 (CAS No. 6368-72-5), which is listed in the initial TSCA Inventory, has shown that between 1 thousand and 11 thousand pounds of this chemical were reported as produced/imported in 1977. **/

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

According to secondary literature sources, Solvent Red 19 can be used to color solvents, vegetable oils, fats, waxes, printing inks, candles, mineral oils, synthetic resin lacquers, cellulose, and plastics. Secondary literature sources indicate that Oil Yellow E190 can be used to color hydrocarbon solvents, oils, fats and waxes/polishes.

Comments/Recommendations

The Celanese Corporation reported that the manufacturers of both dyes, the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), and the National Cancer Institute (NCI) had been notified of the results of the performed *in vitro* genetic screening studies. In addition, Celanese reported that the company is no longer considering the use of the tested dyes.

It should be noted that although a positive *in vitro* test result, when considered alone, may not be sufficient to offer reasonable support for a conclusion of substantial risk, EPA does believe that *in vitro* studies do provide valuable data that can aid in assessing possible risks posed by chemicals to health and the environment. EPA also believes that positive *in vitro* test results in combination with additional information (*e.g.*, knowledge of exposure to or high production of the chemical substance or mixture) would, in many cases, suggest the need for further, more definitive toxicologic study with the results of such studies considered for possible submission to EPA pursuant to Section 8(e) of TSCA.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will screen the reported findings in order to determine the need for further assessment of Oil Yellow E190 and Solvent Red 19.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, NCI/NTP, OW/EPA, OSWER/EPA, and ORD/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0982-0456 S
Page 1 of 3

DATE: OCT 22 1982

SUBJECT: Status Report* 8EHQ-0982-0456 S

Approved – 11/26/82

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Gulf Refining and Marketing Company provided summarized results from an acute rabbit eye irritation (Draize) test of Gulf TS-905-HWCF. Although Gulf described the product as being a high water content fluid, the chemical identities and weight per cent of the fluid's ingredients were claimed by the company as TSCA Confidential Business Information (CBI). According to Gulf, the obtained results indicated that 0.1 ml of concentrated TS-905-HWCF produced irreversible damage in unwashed eyes and damage of a less severe nature in eyes rinsed with water 20-30 seconds following instillation of 0.1 ml of the concentrated product. The submitter reported that 0.1 ml of a 1 to 20 dilution of the product in water was not considered to be a primary eye irritant. According to Gulf, TS-905-HWCF is sent to customers in concentrated form and is diluted with 20 parts water by the customer for use.

Submission Evaluation

Considering that TS-950-HWCF contains several chemical substances which are known to be irritating and in some cases corrosive to mucous membranes (and skin), it is not necessarily surprising that the product in concentrated form was found to cause severe eye damage. Although the 1 to 20 dilution was not considered by the submitter to be a primary irritant, the concentrated product appears to react avidly with corneal tissue. It should also be noted that rinsing the eye shortly after exposure to the concentrated product was not completely effective in preventing permament damage. The observed infiltration of the affected corneas with blood vessels is a part of the healing process that unfortunately causes serious and lasting impairment of vision. An additional concern would be the possibility that following dilution of TS-905-HWCF with 20 parts water, evaporation of the aqueous phase could take place under the conditions of typical use and/or storage thereby concentrating the product.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

EPA FORM 1320-6 (REV. 3-76)

Current Production and Use

In view of the submitter's claim of confidentiality, production/importation range statistics from the TSCA Inventory for the chemical ingredients of TS-905-HWCF will not appear in this report.

According to Gulf, TS-905-HWCF contains water and a soluble additive package comprised of corrosion inhibitors, antiwear agents, and emulsifying agents. Gulf also reported that when diluted with 20 parts water, TS-905-HWCF can be used in hydraulic equipment operation at relatively high pressures.

Comments/Recommendations

Gulf Refining and Marketing Company reported that it plans to alert (via product labelling) all potential handlers and users about the observed TS-905-HWCF toxicity. In its submission, Gulf provided EPA with a copy of the proposed product label containing warnings and handling/first aid instructions.

Based on a preliminary review and evaluation of the chemical toxicity/exposure information contained in 8EHQ-0982-0456 S, it is EPA's preliminary determination that the provided acute rabbit eye irritation results did not warrant submission to the Agency under Section 8(e) of the Toxic Substances Control Act (PL 94-469). The basis for EPA's position is as follows:

> The preface to Part V of EPA's March 16, 1978, "Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" (43 FR 11110) states that "a substantial risk of injury to health or the environment is a risk of considerable concern because of (a) the seriousness of the effect...and (b) the fact or probability of its occurrence." With regard to the seriousness of the effect, Part V explains that the Agency considers the health effcts for which substantial risk information must be reported to include "any pattern of effects or evidence which reasonably supports the conclusion that the chemical substance or mixture can produce cancer, mutation, birth defects, or toxic effects resulting in death, or serious or prolonged incapacitation." The information respecting these effects can be obtained directly or inferred from designed studies (e.g. in vivo experiments and tests as described in Part VI of the policy statement). With regard to the "fact or probability of its occurrence" criterion, Part V also explains that certain types of health effects are so serious that relatively little weight should be given to a chemical's exposure in determining whether a risk is substantial.
>
> EPA's response to Comment 14 in Appendix B of the March 16, 1978, policy statement provides additional guidance with regard to the Section 8(e)-reportability of results obtained from routine acute in vivo range finding tests such LD50

determinations, skin/eye irritation tests, etc. In its response, EPA stated its belief that "many routine tests are based on a knowledge of toxicity associated with a chemical..." EPA's response also directed that unknown effects which occur and are observed and/or determined during acute in vivo range-finding tests may have to be reported if those effects are serious and meet the reporting requirements set forth in Parts V and VI of the policy statement.

Thus, when evaluating the results of acute animal toxicity studies for submission to EPA under TSCA Section 8(e), the Agency believes that submitting companies should consider such factors as the lethal dose, pH, route of adminstration, the occurrence of unexpected effects (which could be obtained via "cage-side" observations, during necropsy, etc.), and the extent and pattern of the exposure of the subject chemical substance(s). In general, when evaluating such information for Section 8(e) reporting, the greater the acute toxicity, the less heavily companies should weigh the tested chemical's exposure, and vice versa.

Based on the preceeding discussion, it is EPA's preliminary determination that the results from the acute rabbit eye irritation study, as provided by the Gulf Refining and Marketing Company in the present notice, did not warrant submission to the Agency pursuant to TSCA Section 8(e). In making this determination, however, it must be understood that EPA may not be aware of additional pertinent information which may have been available to and/or considered by the company in reporting the subject information under TSCA Section 8(e).

a) The Chemical Hazard Identification Branch/AD will request the Gulf Refining and Marketing Company to provide its rationale as to why the reported results offer reasonable support for a conclusion of substantial risk of injury to health or the environment, as defined in EPA's March 16, 1978, Section 8(e) policy statement ("Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk"; 43 FR 11110). The company will also be requested to provide a complete copy of the final report, including protocols and data, from the rabbit eye irritation test cited in the notice.

b) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH and OSHA. A copy of the status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0982-0457
Page 1 of 2

DATE: OCT 5 1982

SUBJECT: Status Report* 8EHQ-0982-0457

Approved 10/6/82

Revision Needed ____________

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The General Electric Company reported preliminary analytical results from a study of groundwater flow and quality at the company's capacitor manufacturing facility in Ft. Edward, New York. According to General Electric, a groundwater sample taken from a well near the southern boundary of the facility was found to contain 2500 ppb (parts per billion) trichloroethylene, 4000 ppb trans-1,2-dichloroethylene, and 60 ppb 1,1,1-trichloroethane; a water sample taken from another well at the facility was reported to contain 220 ppb trichloroethylene.

In addition, the General Electric Company reported that the New York State Department of Health had recently sampled about twenty (20) domestic water supply wells near the Ft. Edward facility and that three (3) wells near the plant's southern boundary were found to contain certain volatile synthetic organic chemicals in excess of New York State Department of Health guidelines. General Electric reported that in addition to the chemicals mentioned above, vinyl chloride was detected by the State.

It should also be noted that the summarized supporting data provided by General Electric indicate that trichlorobenzene, di-2-ethylhexyl phthalate (DEHP), and polychlorinated biphenyls (PCBs) were also detected in water samples taken by the company from certain wells at its Ft. Edward facility.

Submission Evaluation

One of the most obvious concerns with regard to this type of contamination would be the potential for human, animal, and/or plant exposure to water containing toxic levels of chemical pollutants. At sufficient doses and lengths of exposure, the chemical substances cited in the present submission are known to cause adverse mammalian and/or environmental effects.

***NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.**

Current Production and Use

Due to the nature of this TSCA Section 8(e) submission, a review of the production/importation ranges and use(s) of the subject chemicals does not appear to be necessary at this time.

Comments/Recommendations

The General Electric Company stated that its groundwater study is continuing and that the results will be reviewed with the appropriate New York State authorities.

a) Immediately upon receipt of the General Electric Company TSCA Section 8(e) submission, the Chemical Hazard Identification Branch (CHIB/AD/EPA) transmitted copies of the notice to EPA's Region II Office, the Office of Water (OW/EPA), the Office of Solid Waste and Emergency Response (OSWER/EPA), the "Solvents Workgroup" of EPA's Toxic Substances Priorities Committee (TSPC) and the PCB Team in the Chemical Control Division (CCD/OTS/OPTS/EPA) for any warranted and appropriate followup attention.

b) The Chemical Hazard Identification Branch will provide copies of this status report to the previously mentioned EPA Offices/Workgroups/Teams and to the Office of Toxics Integration (OTI/OPTS/EPA) and the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-0982-0458
Page 1 of 3

DATE: OCT 12 1982

SUBJECT: Status Report* 8EHQ-0982-0458

Approved 10/13

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Great Lakes Chemical Corporation reported the final results from several Ames (bacteria) mutagenicity tests of the bis(2,3-dibromopropyl ether) of tetrabromobisphenol A (CAS No. 21850-44-2). According to the submitting company, although the results of an earlier (1976) Ames test were negative, three purified samples of the chemical were recently tested for mutagenicity (Ames test) and found "to induce base-pair substitution mutation and to show detoxification to a large extent by the addition of S-9 activation mix." In a customer notification letter attached to the submission, Great Lakes stated that the negative 1976 Ames test was performed at a dose of 250 micrograms/plate whereas the recently conducted Ames tests were performed at doses of 500 micrograms/plate or greater and yielded a dose-response for mutagenicity. In that letter, Great Lakes also pointed out that the dose level used in the 1976 Ames test was chosen on the basis of toxicity range-finding protocols.

The Great Lakes Chemical Corporation reported that the bis(2,3-dibromopropyl ether) of tetrabromobisphenol A has been a developmental chemical at the company for several years and a commercial product in Europe during the last ten years. Great Lakes also reported that European manufacturers had been questioned about their mutagenicity findings with the subject chemical and that the one European company responding thus far reported negative results.

Submission Evaluation

Although Great Lakes indicated that its submission contained complete copies of the final reports from the subject Ames tests and copies of certain correspondence with the performing laboratory, these documents were not attached to the notice. Without complete copies of those final reports (which should include data and protocols), an evaluation of the reported in vitro mutagenicity is not possible. When Great Lakes was informed (by phone) about the missing attachments, the company stated that the missing reports and correspondence would be transmitted to EPA as soon as possible.

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Current Production and Use

A review of the production range (includes importation volumes) statistics for the bis(2,3-dibromopropyl ether) of tetrabromobisphenol A (CAS No. 21850-44-2), which is listed in the initial TSCA Inventory, has shown that no 1977 production/importation was reported or that all of the production range data reported were claimed as confidential by the manufacturer(s) and importer(s) and cannot be disclosed. (Section 14(a) of the TSCA, U.S.C. 2613 (a)). **/

In its submission, the Great Lakes Chemical Corporation stated that "approximately 25,000 pounds of the compound have been sold in the United States in the last several years with increased volume expected in the next few years" and that the company "presently manufactures the compound in Europe with the transfer of manufacturing to the United States contingent on increased sales volume."

In addition, Great Lakes reported that the major use of the bis(2,3-dibromopropyl ether) of tetrabromobisphenol A is as "a flame retardant in the insulation of electrical cable" and that "some use may occur as a flame retardant in other polyolefin applications in the future." With regard to exposure, the company reported that "there will be negligible contact with the material after installation, and the potential for significant exposure during manufacturing and incorporation into the final product is small."

Comments/Recommendations

The Great Lakes Chemical Corporation stated that its current and known potential customers had been notified of the reported positive mutagenicity results. In its submission, Great Lakes provided a copy of both the customer notification letter and an amended material safety data sheet for the subject chemical.

It should be noted that although a positive in vitro test result, when considered alone, may not be sufficient to offer reasonable support for a conculsion of substantial risk, EPA does believe that in vitro studies do provide valuable data that can aid in assessing possible risks posed by chemicals to health and the environment. EPA also believes that positive in vitro test

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**/ The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

results in combination with additional information (e.g., knowledge of exposure to or high production of the chemical substance or mixture) would, in many cases, suggest the need for further, more definitive toxicologic study with the results of such studies considered for possible submission to EPA pursuant to Section 8(e) of TSCA.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will ask the Great Lakes Chemical Corporation if it is conducting or plans to conduct further studies designed to better define the toxicity of the bis(2,3-dibromopropyl ether) of tetrabromobisphenol A.

b) Upon receipt of the final reports and correspondence cited in the initial submission, the Chemical Hazard Identification Branch will screen the reported mutagenicity findings in order to determine the need for any further assessment of the bis(2,3-dibromopropyl ether) of tetrabromobisphenol A.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, OW/-EPA, OSWER/EPA, and ORD/EPA. In addition, copies of this status report will be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: OCT 25 1982

SUBJECT: *8EHQ-1082-0459 & 8EHQ-1082-0460

Approved 10/27/82

Revision Needed ____________

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

In two separate submissions, the Atlantic Richfield Company provided summary results from acute animal eye/skin irritation studies and a battery of short-term *in vitro* tests of dipropyleneglycol diacrylate (DPGDA; 8EHQ-1082-0459) and pentaerythritol monooleate triacrylate (PEMOTA; 8EHQ-1082-0460). The reported results are summarized in the following table:

Type of Test	DPGDA	PEMOTA
Ames Test (bacteria)	Negative	Negative
Mouse Lymphoma Assay (without activation)	Positive	Positive
Mouse Lymphoma Assay (with activation)	Equivocal	Positive
Chinese Hamster Ovary (CHO) Cell Sister Chromatid Exchange (SCE) Assay (with/without activation)	Positive/ Positive	Negative/ Negative
Eye/Skin Irritation Studies (species not specified)	Severe	Severe

Atlantic Richfield reported that both DPGDA and PEMOTA were shown to be "extremely toxic" to cultured mouse lymphoma and Chinese Hamster ovary cells in the absence of exogenous metabolic activation and that the inclusion of metabolic activation resulted in a several-fold reduction in the chemicals' toxicity in both assays. Atlantic Richfield also reported that excess numbers of chromosomal breaks were noted in the cultured Chinese Hamster Ovary (CHO) cells treated with PEMOTA and DPGDA. With regard to the observed chromosomal breaks, Atlantic Richfield reported that such breaks are not normally seen in the CHO cell Sister Chromatid Exchange assay with other chemicals and further stated:

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> "In the usual SCE assay, the CHO cells are allowed to go through the two cell cycles which result in Metaphase II cells predominating. The toxicity of DPGDA [and PEMOTA] evidently resulted in delaying the cell cycling time which allowed some Metaphase I cells to be visualized. The chromosomal breaks mentioned above were noted in these Metaphase I cells. However, in the SCE assay the chromosomal breaks cannot be quantified due to the limitations of the test."

According to Atlantic Richfield, the performed studies were initiated as part of the company's "continuing effort to develop toxicological information on new chemicals which may be of commercial value."

Submission Evaluation

Although the submitted summarized information indicates that both DPGDA and PEMOTA are severely irritating to the eyes/skin and possess some degree of *in vitro* cytogenic, mutagenic, and/or clastogenic activity, an evaluation of the reported findings is not possible without complete copies of the final reports including test protocols and data. According to the Atlantic Richfield Company, these reports are now in preparation and upon completion will be transmitted to EPA for review.

Current Production and Use

In its submission, the Atlantic Richfield Company stated that DPGDA and PEMOTA are "novel" chemicals that are under development as multifunctional acrylates designed to serve as cross-linking agents in inks and coatings.

Neither dipropyleneglycol diacrylate (DPGDA; CAS Number 57472-68-1) nor pentaerythritol monooleate triacrylate (PEMOTA; no CAS Number assigned) were found to be listed in the non-confidential portion of the Master TSCA Inventory File.

Comments/Recommendations

The Atlantic Richfield Company reported that R&D personnel "had been advised to use caution and proper skin and eye protection when handling [DPGDA and PEMOTA] to preclude any unnecessary exposure." In addition, Atlantic Richfield stated that the "ARCO Chemical Company has decided to postpone further development of [DPGDA and PEMOTA] until the ramifications of the *in vitro* results can be analyzed."

It should be noted that although a positive *in vitro* result, when considered alone, may not be sufficient to offer reasonable support for a conclusion of substantial risk, EPA does believe that *in vitro* studies do provide valuable data that can aid in assessing possible risks posed by chemicals to health and/or the environment. EPA also believes that positive in vitro test results in combination with additional information (e.g., knowledge of potential exposure to or high production of the chemical substance or mixture) would, in many cases, suggest the need for further more definitive toxicologic study with the results considered for possible submission to EPA pursuant to Section 8(e) of TSCA.

EPA has received and evaluated the following TSCA Section 8(e) submissions on acrylic acid esters of various glycols/polyols: (neopentylglycol diacrylate, 8EHQ-0178-0028 et seq.; triethyleneglycol diacrylate, 8EHQ-0981-0410 et seq.; tetraethyleneglycol diacrylate, 8EHQ-0981-0411 et seq.; and pentaerythritol di-, tri- and tetra- acrylates, 8EHQ-0882-0454 et seq.). In addition, the Chemical Hazard Identification Branch has prepared a Chemical Hazard Information Profile (CHIP) on neopentylglycol diacrylate and is currently considering the preparation of additional CHIPs on acrylic acid esters of glycols/polyols.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Atlantic Richfield Company to ensure that when submitted, the final reports of the cited studies include complete copies of the test protocols and data obtained. In addition, Atlantic Richfield will be asked if the company is conducting or plans to conduct additional studies designed to further define the toxicity of DPGDA and PEMOTA.

b) The Chemical Hazard Identification Branch will screen the information submitted by the Atlantic Richfield Company on PEMOTA and DPGDA in order to determine the need for further assessment of those particular chemical substances. In addition, the Chemical Abstract Service will be requested to assign a CAS Registry Number to pentaerythritol monooleate triacrylate (PEMOTA).

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, FDA, CCD/OTS/EPA, OW/EPA, OSWER/EPA, and ORD/EPA. A copy of this report will also be provided to both the Office of Toxics Integration (OTI/OPTS/EPA) and Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1082-0461
Page 1 of 2

DATE: OCT

SUBJECT: Status Report* 8EHQ-1082-0461

Approved 10/29

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

Air Products and Chemicals, Inc. reported that it was recently informed (via a private communication from E. I. du Pont de Nemours & Company, Inc.) of the results of a chronic (15-month) feeding study of "chlorinated toluenediamine" in rats. According to Air Products and Chemicals, Inc., the 15-month study was conducted by Du Pont prior to 1976 and involved chlorinated toluenediamine dose levels of 1000 and 2000 ppm in the feed. The submitting company stated that although it does not have the actual report(s) from the Du Pont study, liver tumors were reportedly observed in animals at both dose levels with a higher incidence of liver tumors observed in animals receiving the higher dose.

In its submission, Air Products and Chemicals, Inc. stated that "chlorinated toluenediamine, because of its similiarity in structure to toluenediamine which has been shown to cause cancer in laboratory animals, has been treated in [the company's] laboratory with the same cautions as those which are applied to toluenediamine, itself." Air Products and Chemicals, Inc. further stated that the Du Pont findings were not surprising because "a number of phenylenediamines have been shown to cause cancer in laboratory animals, and further validates the precautions taken in [the Air Products and Chemicals, Inc.] laboratory in the handling of chlorinated toluenediamine."

Submission Evaluation

Assuming (based on the submitter's chemical terminology) that the ring is the site of chlorination, it is not necessarily surprising, as indicated by the the submitter, that some chlorinated toluenediamines may possess oncogenic activity toward the rat liver. In order to properly evaluate the significance of the reported oncogenicity, however, a complete copy of the 15-month chlorinated toluenediamine feeding study final report, including the protocols, data, and results of statistical analyses (if performed), is needed. Considering the fact that there are many possible isomeric configurations for chlorinated toluenediamines, the exact identity of the subject chemical(s) is also needed.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

Air Products and Chemicals, Inc., reported that it "has been conducting a research and development activity involving the synthesis [and purification] of small quantities of chlorinated toluenediamine." The submitter also reported that "although some samples of chlorinated toluenediamine have been utilized in experimental polymers, their distribution has been very restricted, and the amounts of chlorinated toluenediamine so utilized would be less than 10 lbs."

A formal search of the Master TSCA Inventory File for the subject chlorinated toluenediamine(s) will be requested upon EPA's receipt of the exact identity of the chemical substance(s).

Comments/Recommendations

In its submission, Air Products and Chemicals, Inc. stated that E. I. du Pont de Nemours & Company, Inc. had been advised of the submitter's intention to report the subject oncogenicity findings to EPA under Section 8(e) of TSCA.

The Test Rules Development Branch (TRDB/AD/EPA) is currently evaluating toxicity and exposure data for certain phenylenediamines as recommended by the Interagency Testing Committee (ITC).

a) E. I. du Pont de Nemours & Company, Inc. recently informed EPA (by phone) that Du Pont will provide EPA with a copy of the final report from the 15-month chlorinated toluenediamine feeding study in rats. The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request Du Pont to ensure that EPA receives a complete copy of that final report, including experimental protocols, data, and the results of statistical analyses (if performed). In addition, both Du Pont and Air Products and Chemicals, Inc. will be requested to provide the exact identity of the subject chlorinated toluenediamine(s).

b) The Chemical Hazard Identification Branch will screen the reported information in order to determine the need for further assessment of the subject chemical substance(s).

c) The Chemical Hazard Identification Branch will transmit copies of this status report to NIOSH, OSHA, CPSC, OW/EPA, OSWER/EPA, OANR/EPA, ORD/EPA, CCD/OTS/EPA, and TRDB/AD/-EPA. Copies will also be sent to the Office of Toxics Integration (OTI/OPTS/EPA) and Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1182-0462
Page 1 of 6

DATE: [illegible] 8 1982

SUBJECT: Status Report* 8EHQ-1182-0462

Approved 12/9

Revision Needed ______

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Eastman Kodak Company provided summarized final results from a 16-day male rat feeding study and several other acute/subacute *in vivo* toxicity studies of p-nitrobenzamide (CAS No. 619-80-7). With regard to the results obtained from the performed 16-day feeding study, Eastman Kodak reported:

> "The compound was added to rat chow at levels of 1.0%, 0.1% or 0.0% with 1.0% corn oil and fed to 3 groups of five male rats. The 1.0% group ate less feed and gained less weight than the controls. The mean daily dose of compound was 426 mg/kg/day. The 0.1% group ate and gained weight normally; the mean daily intake of the compound was 78 mg/kg/day. On day 14 of the study four of the five rats on the 1.0% diet developed unusual gaits. The animals walked with hyperextension of the hindlimbs and overstepping with the hindpaws. The tails were held unusually high while walking. Visual and tactile placing, vestibular drop, and flexor reflexes were normal. Weakness was not evident. Bowel and bladder control was unaffected. The study was extended by two days for further observation. On the fifteenth day, all rats in the 1.0% group were equally affected. No progression of neurological impairment was observed. The 0.1% group remained unaffected. At autopsy, day 17, the clinical condition of the 1.0% group was unchanged or slightly improved."

Eastman Kodak reported further that "compound-related histologic abnormalities occurred in the brain, adrenal glands, testes, epididymides, male accessory sex organs, pituitary, and adipose tissue." The company also reported that renal hyalin droplet degeneration occurred in both the 1.0% and 0.1% groups. The submitter stated, however, that because "the frequency of degeneration was not dose-related and was similar to that which occurs spontaneously in male rats...hyalin droplet degeneration was not considered a compound-related effect." Eastman Kodak also stated that "rats consuming the 0.1% diet showed no compound-related effects."

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The following excerpts from the submission pertain to histopathologic abnormalities observed in specific organs/tissues of the male rats in the 16-day feeding study of p-nitrobenzamide:

Brain: "Brain lesions consisted of bilaterally symmetrical areas of malacia [morbid softening] in the cerebellum and pons. Malacia was limited to nuclear groups including the deep cerebellar nuclei, ventral cochlear nucleus, lateral and superior vestibular nuclei, and a nuclear group adjacent but dorsolateral to the superior olivary nucleus. Vascular changes within affected areas included perivascular hemosiderin [insoluble iron] deposition, perivascular hemorrhage, and prominent vascular walls. Infiltrating mononuclear phagocytic cells heavily cuffed occasional vessels and were present within vacuolated areas."

Specifically with regard to the observed brain lesions, Eastman Kodak noted that although a computerized search of the scientific literature for toxicity data on p-nitrobenzamide was negative, "similar areas of malacia have been described following single oral doses of 450 mg/kg of nitrobenzene" and that "the descriptions of lesion morphology and location suggest that the brain lesions caused by nitrobenzene and p-nitrobenzamide may be identical." In addition, the company pointed out:

> "The cerebral lesions produced by nitrobenzene and p-nitrobenzamide have a prominent vascular component and are located in nearly the same transverse plane through the brain stem. This particular region of the brain stem is at the distal end of two arterial systems supplying the cerebellum and pons. These systems include the basilar artery and the internal carotid artery through the circle of Willis. This region of the brain is thus in or near a "watershed" area which is potentially susceptible to changes in arterial perfusion."

Adrenal glands: "Adrenal glands from all five rats in the 1.0% group were altered. The most common effects were vascular congestion in the zona fasciculata and zona reticularis and cytoplasmic vacuolization of zona fasciculata. Fasciculata cells also appeared diffusely enlarged or hypertrophied. Diffuse necrosis of the zona reticularis was observed in [one rat] and karyopyknosis [shrinkage of the nuclei] was observed in the same region in [two other rats]. [One other rat] showed congestion and hemorrhage in all areas of the cortex."

Reproductive System: "Reproductive effects included atrophy of accessory sex organs in four rats, severe atrophy of testicular spermatogenic epithelium, and near complete absence of spermatozoa in the epididymides. A spermatic granuloma was also present in an epididymis from [one] rat. In the testes, there was a total absence of spermatozoa and spermatids. Spermatocytes and spermatogonia were reduced but present. The most severely affected tubules contained only Sertoli cells."

Adipose Tissue: "All rats in the 1.0% group developed atrophy of body adipose tissue."

Pituitary Gland: "[Two rats] showed degranulation of pituitary acidophiles."

With regard to the results obtained from other *in vivo* acute/-subacute studies of p-nitrobenzamide, Eastman Kodak reported that the LD50 for male rats was 673 mg/kg and 476 mg/kg for female rats with deaths occurring within two days of dosing. According to the submitter, the clinical signs exhibited by the rats included slight to severe weakness, shallow breathing, and decreased food consumption. The company also reported that the dermal LD50 (test species not identified) was in excess of 1000 mg/kg with only slight skin irritation noted. In addition, the submitter reported that "only slight exacerbation of the original minimal dermal effect" was observed following 10 daily applications (test species not identified) of p-nitrobenzamide as a 50% weight/volume suspension in ethanol:glycerol (1:9). The company also stated that p-nitrobenzamide was found to be only slightly irritating to the eyes (test species not identified) and "did not elicit an allergic contact dermatitis reaction in 10 guinea pigs tested."

Finally, the Eastman Kodak Company reported that no adverse human effects related to p-nitrobenzamide exposure have been observed.

Submission Evaluation

With regard to the reported neurotoxicity, the provided descriptions of functional signs in exposed animals and central nervous system (CNS) lesions were of a high quality and are, therefore, most likely valid. The performed feeding study identified signs of motor system dysfunction and widespread midbrain cell loss in areas subserving a variety of functions. Effects were reported after dietary exposure (1.0%) that also produced significant decreases in food intake (a calculated dose of only 426 mg/kg) but no effects were seen after the smaller dose (0.1%; 78 mg/kg). It is not clear what effects intermediate doses of relatively short duration would have or what effects subchronic doses (at least 90 days) would have.

The reported similarity of the obtained results to the neurotoxic effects of nitrobenzene is generally valid and supported by the existing literature on nitrobenzene both with respect to the neurotoxic signs and pathology and their likely dependence on cardiovascular and hematologic effects. It is well known that nitrobenzene as well as many other amino- and nitroaromatics produce methemoglobinemia, resulting in the deprivation of brain tissue of oxygen (Smith, 1975). In addition, Smith noted that "some aromatic amino and nitro compounds, such as aniline and nitrobenzene, have central and prominent cardiac effects that in some species, including man, appear to be the proximal cause of death."

It should also be noted that there are "marked species differences in response to methemoglobin formers" (Beard and Noe, 1981). Beard and Noe reported that man is about 10 times as sensitive as the rat, although the relative contribution of methemoglobinemia to observed toxic effects is unknown. In addition, it has been suggested (Jacobs, 1978) that sensory systems (including the visual system) are particularly sensitive to changes in vascular permeability. Optic nerve pathology has also been associated with nitrobenzene exposure (Yoshida, 1962) and might well be expected for p-nitrobenzamide.

In general, the reported neurotoxicity and some of the other reported toxic effects of p-nitrobenzamide are consistent with those observed in humans and many animal species following exposure to nitrobenzene (USEPA, 1980). Further evaluation of the results obtained from the performed 16-day p-nitrobenzamide feeding study will be possible following EPA's receipt of the final report which should include the test protocol and data.

Current Production and Use

A review of the production range (includes importation volumes) statistics for p-nitrobenzamide (CAS No. 619-80-7), which is listed in the initial TSCA Inventory, has shown that between 2 thousand and 21 thousand pounds of this chemical were reported as produced/imported in 1977. **/ In its submission, Eastman Kodak stated that its annual production volume of p-nitrobenzamide is expected to be approximately 50 thousand to 100 thousand pounds.

Eastman Kodak reported that p-nitrobenzamide is manufactured at one plant site and then shipped to another plant site where the chemical is used as an intermediate. Although the submitter reported that the chemical is not found in the final product, the nature of that product was not indicated in the submission.

With regard to potential occupational exposure to p-nitrobenzamide, Eastman Kodak reported that such exposure could occur at the isolation step during the manufacturing process and during unloading of the drummed chemical into a reactor for use as an intermediate. According to the company, a total of eight people (two people at a time) wearing organic vapor cartridge equipped respirators, rubber aprons, and gloves are involved in the manufacturing process and forty people (two people at a time) wearing gloves are involved in dumping the drummed chemical into

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**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

the reactor. Eastman Kodak reported that the potential exposure time for the forty individuals involved in the unloading operation would be approximately one hour per year.

With regard to actual measurements of occupational exposure to p-nitrobenzamide, Eastman Kodak reported that two workplace air monitoring studies conducted at the manufacturing facility have shown airborne p-nitrobenzamide concentrations ranging from 2 mg/m^3 to 40 mg/m^3 with a median value of 18 mg/m^3 (the length of air sampling time was not given in the submission). The company stated that professional review of the unloading operation indicated that p-nitrobenzamide exposure at this stage should be very low but did not indicate the nature of the information that served as the basis for this judgment.

With regard to environmental release of p-nitrobenzamide, Eastman Kodak stated that "approximately 3% of this material will be lost in the waste water during manufacture and drained into the industrial waste water treatment facility."

Comments/Recommendations

In its submission, Eastman Kodak stated that the previously described routine handling procedures are expected to adequately protect against the reported toxic effects. The company also stated that a summary of the reported findings was being added to information sheets for distribution to employees. In addition, Eastman Kodak reported that aquatic toxicity tests of p-nitrobenzamide were underway.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request Eastman Kodak to provide complete copies of the final reports, including test protocols and data, from all of the mammalian toxicity studies cited in the initial submission. In addition, Eastman Kodak will be requested to provide, when available, complete copies of the final reports, including test protocols and data, from the company's ongoing aquatic toxicity studies of p-nitrobenzamide.

b) The Chemical Hazard Identification Branch will screen the reported information on p-nitrobenzamide in order to determine the need for further assessment.

c) The Chemical Hazard Identification Branch will transmit copies of this status report to NIOSH, OSHA, CPSC, FDA, OW/EPA, OSWER/EPA, ORD/EPA, and TRDB/AD/EPA. Copies will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

References

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1182-0463
Page 1 of 4

DATE: DEC 10 1982

SUBJECT: Status Report* 8EHQ-1182-0463

Approved 12/10

Revision Needed ______

FROM: Justine Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

The Diamond Shamrock Corporation provided a translation of a German draft summary from a report of a chronic (30-month) study of sodium bichromate and calcium chromate administered at varying doses via intratracheal instillation to groups containing 40 male and 40 female Sprague-Dawley rats. In its submission, Diamond Shamrock stated that although EPA is "aware of historic information on the toxicological properties of chrome and chrome compounds, particularly in relation to Chrome VI compounds and lung cancer," the company believed that its submission contained new information about sodium bichromate.

The provided summary stated that it could be assumed that the slightly soluble inorganic chromium VI compounds are carcinogenic but that the carcinogenicity of the easily soluble chromium VI compounds was still in question at least to the point that the carcinogenic potential appears lower in the case of the more soluble chromates. The stated purpose of the performed study was to provide an answer to that question by comparing the tumorigenic potential of calcium chromate (which is slightly water soluble) to that of the more easily soluble sodium bichromate (dihydrate).

With regard to the test animals' appearance, behavior, food consumption, and the results of clinical examinations, the summary stated that there was no indication of toxic effects other than a 30 minute period of continuous and pronounced breathing difficulty observed after the 415th day of the study in almost all rats receiving a dose of 1.25 mg/kg sodium bichromate once per week. With regard to carcinogenicity, the summary stated that "a carcinogenic effect was only produced by both chromates in the lung" and that "there was no differences in intensity of effect between the sodium dichromate and the dissolved calcium chromate."

***NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.**

The reported pathological results (excluding those from the positive and negative controls) are contained in the following table:

Test Chemical	Dose Regimen	Lung Tumors Benign	Lung Tumors Malignant
Sodium Bichromate (dihydrate)	5 X 0.01 mg/kg/week	0	0
"	5 X 0.05 mg/kg/week	0	0
"	5 X 0.25 mg/kg/week*	0	0
"	1 X 0.05 mg/kg/week	0	0
"	1 X 0.25 mg/kg/week	1	0
"	1 X 1.25 mg/kg/week	12	7†
Calcium Chromate	5 X 0.25 mg/kg/week	5	1
"	1 X 1.25 mg/kg/week	11	3†

* previously determined maximum tolerated dose (MTD)

† includes one (1) doubtful lung tumor

With regard to the above results, the summary stated that for "both chromates - on the same weekly dose - loading-dose treatment (1 x /week) was more effective than when the same dose was distributed between 5 administrations (5 x /week)," and that "from this, it can be deduced that an even more uniform distribution (inhalation in man) possibly reveals an even weaker effect."

In conclusion, the performing laboratory stated that the obtained results could be summarized in the following way:

> "The very water-soluble sodium dichromate and dissolved calcium chromate have a weak carcinogenic effect, when toxic loading doses or massive doses lying within the maximal tolerable dose range are absorbed over a very long period of time. The potential carcinogenic effect of water-soluble dichromates is, as a result, slight. A uniform distribution of the doses over the period has a weaker effect than massive doses. According to the rules of general carcinogenesis, rather would the opposite have been expected. The results support the view that defence mechanisms, which can be overcome by massive loading doses, are involved in the case of the chromate investigated. The question remains of how slightly soluble chromates behave under similar test conditions."

Submission Evaluation

In general, the carcinogenic and genotoxic potential of chromium compounds has been well established. Although carcinogenicity has so far only been clearly established in animal bioassays with hexavalent chromium, both hexa- and trivalent chromium are known to be genotoxic. In addition, epidemiological evidence indicates that chromium is carcinogenic in humans.

In view of this background, the observed induction of lung tumors in rats by intratracheal instillation of sodium bichromate and calcium chromate is not unexpected. Although the submitted data are suggestive of a dose-response relationship with sodium bichromate, the tumor incidences are so low that it is unlikely that this relationship is statistically significant. It is also highly unlikely that the difference between the malignant tumor incidences of the 5 x 0.25 mg/kg/week and 1 x 1.25 mg/kg/week groups receiving calcium chromate is statistically significant. Moreover, in addition to the likely lack of statistical significance, the group sizes are too low to solidly establish the findings in a way relevant to humans. It should also be noted that the presented results are inadequate to support the conclusion by the performing laboratory that "...defence mechanisms, which can be overcome by massive loading doses, are involved in the case of the chromates investigated."

Current Production and Use

A review of the production range (includes importation volumes) statistics for sodium bichromate (CAS No. 10588-01-9), which is listed in the initial TSCA Inventory, has shown that between 300 million and 1.2 billion pounds of this chemical were reported as produced/imported in 1977. **/ A review of the production range (includes importation volumes) statistics for calcium chromate (CAS No. 13765-19-0), which is listed in the initial TSCA Inventory, has shown that between 14 thousand and 146 thousand pounds of this chemical were reported as produced/imported in 1977. **/

According to secondary literature sources, sodium bichromate can be used in the manufacture of pigments, in leather tanning, and in electroplating operations; as a corrosion inhibitor, defoliant, catalyst, wood preservative, and a reactant in oxidative reactions. Secondary literature sources report that calcium chromate can be used as a pigment, corrosion inhibitor, battery depolarizer, and oxidizing agent; and used in the preparation of coatings for light metal alloys.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

Comments/Recommendations

In the cover letter to its submission, the Diamond Shamrock Corporation stated that although the company "has not concluded that qualitatively or quantitatively there is any increase in risk to health or the environment indicated by the preliminary results of this study" the company believes that "work practice and safety measures employed during the production of chrome chemicals, training sessions given to employees, and information supplied to customers on the safety precautions in use of chrome chemicals minimize the potential of exposure to these products."

In 1974 and again in 1980, the International Agency for Research on Cancer (IARC) evaluated the carcinogenic risk to humans posed by exposure to chromium and chromium compounds (IARC Monographs; Volume 2 (1974) and Volume 23 (1980)). The National Institute for Occupational Safety and Health (NIOSH) published "Criteria Documents" containing recommended standards for occupational exposure to chromic acid (1973) and other chromium IV compounds (1975). NIOSH has also published (1976) a "Current Intelligence Bulletin" pertaining to chrome pigments. In addition, according to a recently published National Toxicology Program (NTP) review of the status of government-sponsored research, there are a number of ongoing toxicologic studies of chromium and chromium compounds.

A number of TSCA Section 8(e) and "For Your Information (FYI)" submissions pertaining to chromium and chromium compounds have been received and reviewed by EPA's Office of Toxic Substances. In addition, a number of health and evironmental assessments of chromium and chromium compounds have been prepared or are being prepared by various Program Offices within EPA. Also, chromium and/or certain chromium compounds are covered by authorities (e.g., Clean Water Act) administered by EPA.

a) According to the Diamond Shamrock Corporation, the full final report from the chronic intratracheal instillation study will not be available until 1983. The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request Diamond Shamrock to ensure that EPA receives a complete copy of the final report including protocols and data as soon as that report is received by the company.

b) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will screen the reported information in order to determine the need for further OTS assessment of the subject chemical substances.

c) The Chemical Hazard Identification Branch will transmit a copy of this status report to NIOSH, OSHA, CPSC, OW/EPA, OSWER/EPA, OANR/EPA, and ORD/EPA. A copy of this report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and the Industry Assistance Office (IAO/OTS/-EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1182-0464
Page 1 of 2

DATE: DEC 1 1982

SUBJECT: Status Report* 8EHQ-1182-0464

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Approved 12/1

Revision Needed

Submission Description

Vulcan Chemicals (a division of the Vulcan Materials Company) provided summarized results from two in vivo toxicologic studies of chloromethane (methyl chlroride; CAS No. 74-87-3) that were carried out by CIIT (Chemical Industry Institute of Toxicology).

According to Vulcan Chemicals, male Fischer 344 rat reproduction was "totally impaired" following inhalation exposure to 1500 ppm chloromethane for 6 hours per day, 5 days per week for 10 weeks. The submitter further stated that "histopathological evaluation of 10 males in the exposed group confirmed a 100 percent incidence of testicular atrophy and a 20 percent incidence of sperm granuloma formation." In addition, Vulcan Chemicals reported that a B6C3F1 mouse inhalation teratogenicity study conducted at 250, 500, or 750 ppm chloromethane "revealed a dose-dependent and statistically significant increase in the incidence of heart defects at the mid and high dose exposures."

Submission Evaluation

In its submission, Vulcan Chemicals stated that the Test Rules Development Branch/Assessment Division/Office of Toxic Substances (OTS) had received the subject studies directly from CIIT. The evaluation of the reported and other toxic effects of chloromethane is being conducted by scientists in the Test Rules Development Branch in conjunction with scientists in the Health and Environmental Review Division/OTS. Chloromethane was initially recommended in October 1977 by the Interagency Testing Committee (ITC) to EPA for testing consideration under Section 4 of the Toxic Substances Control Act. On July 18, 1980, the Test Rules Development Branch/AD published (45 FR 48524) a proposed "test rule" for carcinogenicity and teratogenicity testing of chloromethane. In addition, the Office of Toxic Substances is currently gathering additional exposure and toxicity information on chloromethane under TSCA Sections 8(a) and 8(d), respectively.

***NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.**

Current Production and Use

A review of the production range (includes importation volumes) statistics for chloromethane (methyl chloride; CAS No. 74-87-3), which is listed in the initial TSCA Inventory, has shown that between 281 million and 960 million pounds were reported as produced/imported in 1977. **/ The July 14, 1982 issue of Chemical & Engineering News reported a preliminary figure of 362 million pounds for U.S. chloromethane production in 1981.

According to secondary literature sources, chloromethane can be used as a catalyst carrier in certain types of polymerization reactions. Chloromethane can also be used in the manufacture of silicones, tetramethyl lead, synthetic rubber, methyl cellulose, refrigerants, fumigants, and certain organic chemicals (e.g., chloroform, carbon tetrachloride, methylene chloride). In addition, the chemical can be used as an extractant, a propellant and an herbicide.

Comments/Recommendations

In 1974, the Occupational Safety and Health Administration (OSHA) set the current occupational standard for chloromethane exposure at an 8 hour time-weighted average (TWA) of 100 parts per million (ppm) in air with a 200 ppm ceiling level (39 CFR 23540). In 1980, the ACGIH (American Conference of Governmental Industrial Hygienists) recommended a threshold limit value (TLV) for chloromethane at 50 ppm in air. In addition, chloromethane is currently considered by EPA as a priority water pollutant under Section 307 of the Clean Water Act (CWA).

a) In view of EPA's general interest in company actions taken on a voluntary basis in response to chemical toxicity/exposure information, the Chemical Hazard Identification Branch (CHIB/AD/EPA) will request Vulcan Chemicals to describe its actions taken in light of the reported toxicity information on chloromethane to warn workers and others and to reduce and/or eliminate exposure to the subject chemical.

b) The Chemical Hazard Identification Branch will provide a copy of this status report to NIOSH, OSHA, CPSC, FDA, OW/-EPA, OSWER/EPA, OANR/EPA, ORD/EPA, and TRDB/AD/EPA. In addition, a copy will be transmitted to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

**/ This production range information does not include any production/importation data claimed as confidential by the person(s) reporting for the TSCA Inventory, not does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations (40 CFR 710).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1182-0465
Page 1 of 2

DATE: JAN 4 1983

SUBJECT: Status Report* 8EHQ-1182-0465

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Approved 1/6

Revision Needed ____

Submission Description

The Celanese Corporation provided complete copies of the final reports, including test protocols and data, from several in vitro genetic screening assays of two commercial dyes: Calco Oil Bronze Y and Calco Oil Red YM. According to Celanese, Calco Oil Bronze Y displayed mutagenic activity in an Ames Salmonella typhimurium (bacteria) assay both with and without exogenous metabolic activation, and mutagenic activity in cultured mouse lymphoma cells without activation. Calco Oil Red YM was reported by Celanese to have exhibited mutagenic activity in both the Ames and mouse lymphoma cell assays only in the presence of metabolic activation.

Submission Evaluation

As reported by Celanese, Calco Oil Bronze Y was shown to possess mutagenic activity in Salmonella typhimurium (bacteria) when tested with and without exogenous metabolic activation. Although the submitter's cover letter stated that Calco Bronze Y was found to be positive in cultured mouse lymphoma cells when tested without metabolic activation, a review of the data contained in the provided final reports revealed that Calco Bronze Y induced specific gene locus mutation in mouse lymphoma (L5178Y) cells only in the presence of exogenous metabolic activation. In addition, a review of the provided data on Calco Oil Red YM confirmed the submitter's statement that this particular azo dye mixture was mutagenic only in the presence of metabolic activation in both Salmonella typhimurium and cultured mouse lymphoma cells.

It should be noted that although the performed Ames Salmonella typhimurium assays on Calco Oil Bronze Y and Calco Oil Red YM did provide data that could be used in evaluating mutagenicity, these bacterial assays were not conducted in accordance with U.S. EPA or Organization for Economic Cooperation and Development (OECD) guidelines. Both the EPA and OECD guidelines recommend the use of two (2) plates per dose point and the confirmation of all results in an independent assay.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

Current Production and Use

According to the Celanese Corporation, there are no specific Chemical Abstract Service (CAS) Registry Numbers assigned to either Calco Oil Bronze Y or Calco Oil Red YM as they are azo dye mixtures. Celanese did not, however, identify the chemical constituents of either of the tested dye mixtures.

In its submission, Celanese reported that although both Calco Oil Bronze Y and Calco Oil Red YM were used at one time for tinting industrial polyester yarn, these dye mixtures are not being used by the company at the present time. No other information on the specific use(s) of Calco Oil Bronze Y or Calco Oil Red YM was located in the secondary literature sources consulted.

Comments/Recommendations

In the cover letter to its submission, the Celanese Corporation reported that it had provided copies of the submitted *in vitro* mutagenicity test reports to the supplier of both dyes. The Celanese cover letter also indicated that the subject reports had been transmitted to the National Institute for Occupational Safety and Health (NIOSH), the Occupational Safety and Health Administration (OSHA), and the National Cancer Institute (NCI).

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the Celanese Corporation to provide the exact chemical identity (including CAS Numbers, if known) and amount of each constituent in Calco Oil Bronze Y and Calco Oil Red YM.

b) The Chemical Hazard Identification Branch will screen the reported information in order to determine the need for further assessment of Calco Oil Bronze Y, Calco Oil Red YM or any of the chemical components of those dye mixtures.

c) The Chemical Hazard Identification Branch will transmit copies of this status report to NIOSH, OSHA, CPSC, FDA, NCI/NTP, OW/EPA, OSWER/EPA, and ORD/EPA. In addition, copies will be sent to the Office of Toxics Integration (OTI/OPTS/EPA) and Industry Assistance Office (IAO/OTS/-EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: JAN 4 1983

SUBJECT: Status Report* 8EHQ-1182-0466

Approved 1/4/83

Revision Needed ____________

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Submission Description

Pursuant to Section 8(e) of TSCA, E. I. du Pont de Nemours & Company, Inc. submitted a written followup report concerning an accidental atmospheric release of approximately 1100 pounds of chlorine gas (CAS No. 7782-50-5) from the company's plant at Niagara Falls, New York According to Du Pont, 76 people (most of whom were attending an evening football game) were affected and reported to nearby hospitals for observation. The company reported that although most of the affected people were examined and released immediately, 3 individuals were held overnight for 1 or 2 nights. Du Pont also reported that the company was not aware of any person suffering serious or prolonged incapacitation due to the chlorine release. In addition, Du Pont stated that there was no evidence of any chlorine release-related adverse environmental effects.

Submission Evaluation

It is generally well known that chlorine gas is highly irritating, especially to the mucous membranes of the eyes and respiratory tract. Inhalation of sufficient amounts of chlorine gas may lead to serious human health effects such as bronchitis, pulmonary edema, bronchopneumonia, tachycardia (increased heart beat), and possibly death.

Current Production and Use

Due to the nature of this submission, a review of the current production and uses of chlorine does not appear to be warranted for this status report.

***NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.**

EPA FORM 1320-6 (REV. 3-76)

Comments/Recommendations

In its submission, Du Pont stated that when the company learned of the chlorine gas release, it immediately notified appropriate local/state authorities and EPA pursuant to the mandatory reporting provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; "Superfund").

According to Part V(c) of EPA's March 16, 1978, TSCA Section 8(e) policy statement ("Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" 43 FR 11110), an emergency incident of environmental contamination is considered reportable to EPA pursuant to Section 8(e) if the incident involves "any environmental contamination by a chemical substance or mixture to which any...[serious] adverse effects [have] been ascribed and which because of the pattern, extent, and amount of contamination (1) seriously threatens humans with cancer, birth defects, mutation, death, or serious or prolonged incapacitation, or (2) seriously threatens non-human organisms with large scale or ecologically significant population destruction." Part VII of the policy statement directs, however, that such information need not be reported under TSCA Section 8(e) if the information has already been formally reported to EPA pursuant to mandatory reporting requirements contained in other authorities administered by EPA (e.g., "Superfund"). It should be noted, however, that chemical release-related reporting requirements contained in such other authorities are, for the most part, triggered by incidents involving releases of specified amounts (i.e., reportable quantities (RQs)) of specific (i.e., listed) chemical substances. In those cases involving a release of less than the reportable quantity of a listed chemical or a release of a chemical not listed in such other authorities, companies should consider the need for reporting pursuant to Section 8(e) of TSCA.

In view of the above discussion and considering that 1) the Du Pont chlorine gas release involved a release of a reportable quantity of a listed chemical substance, and 2) the incident was immediately reported by the company to EPA pursuant to the notification provisions of CERCLA ("Superfund"), there was no need for Du Pont to also notify EPA under TSCA Section 8(e).

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will transmit a copy of this status report to NIOSH, OSHA, OANR/EPA, and OSWER/EPA. A copy of this status report will also be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and to the Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

8EHQ-1282-0467
Page 1 of 3

DATE: JAN 20 1983

SUBJECT: Status Report* 8EHQ-1282-0467

FROM: Justine L. Welch, Team Leader
Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief
Chemical Hazard Identification Branch/AD

Approved 1/21/83

Revision Needed ______

Submission Description

Following receipt and review of a National Toxicology Program (NTP) draft report containing the results of an NTP bioassay of ethyl acrylate (CAS Number 140-88-5) administered chronically by gavage to male and female mice and rats, the Union Carbide Corporation submitted a summary of certain toxicologic findings presented in that report. According to Union Carbide, "compound-related increases in the incidence of inflammation, hyperplasia, and hyperkeratosis of the forestomach were observed in the treated animals." In addition, the submitter stated that "for animals of each sex, incidences of squamous cell papillomas, squamous cell carcinomas, or, either papillomas or carcinomas occurred with statistically significant positive trends, and the incidences in the treated groups were significantly higher than in the vehicle (corn oil) controls."

Submission Evaluation

Although the submitted summarized results indicate that ethyl acrylate demonstrated oncogenic activity in the performed study, a copy of the actual draft bioassay report should be obtained directly from NTP in order for EPA to more properly evaluate the obtained toxicologic findings.

Current Production and Use

A review of the production range (includes importation volumes) statistics for ethyl acrylate (CAS Number 140-88-5), which is listed in the initial TSCA Inventory, has shown that between 70 million and 200 million pounds of this chemical were reported as produced/imported in 1977. This production range information does not include any production/importation data claimed as confidential by those persons reporting for the TSCA Inventory, nor does it include any information which would compromise Confidential Business Information. The data submitted for the TSCA Inventory, including production range information, are subject to the limitations contained in the Inventory Reporting Regulations.

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*NOTE: This status report is the result of a preliminary staff evaluation of information submitted to EPA. Statements made herein are not to be regarded as expressing final Agency policy or intent with respect to this particular chemical. Any review of the status report should take into consideration the fact that it may be based on incomplete information.

According to secondary literature sources, ethyl acrylate is used mainly in the manufacture of polymers and acrylic paints, and as a chemical intermediate.

Comments/Recommendations

In its submission, Union Carbide stated that the company does "not plan any actions involving notifying employees, customers, other government agencies, etc. of the information, but will consider that question when the final report is in hand and the official opinion of the significance of the information by the scientists in the National Toxicology Program can be reviewed."

It should be noted that EPA believes that the toxicologic information on ethyl acrylate which was obtained by the Union Carbide Corporation was appropriate for reporting pursuant to Section 8(e), the substantial risk information reporting provision of the Toxic Substances Control Act (TSCA; PL 94-469). The Agency's position is based on the following discussion.

TSCA Section 8(e) states that "any person who manufactures, processes, or distributes in commerce a chemical substance or mixture and who obtains information which reasonably supports the conclusion that such substance or mixture presents a substantial risk of injury to health or the environment shall immediately inform the [EPA] Administrator of such information unless such person has actual knowledge that the Administrator has been adequately informed of such information." The types of information that need not be reported (i.e., that information about which subject persons can automatically assume the EPA to be "adequately informed") are clearly defined in Part VII of EPA's March 16, 1978, Section 8(e) policy statement ("Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" 43 FR 11110). Part VII of the Section 8(e) policy statement states in part for example that information need not be reported to EPA under Section 8(e) if the information has been published in the open scientific literature referenced by certain abstracting services or submitted in writing to EPA pursuant to mandatory reporting requirements under TSCA or any other authority administered by EPA. In addition to the various types of "non-reportable" information which are cited in Part VII of the 8(e) policy statement, one can automatically assume that EPA has been "adequately informed" about the results of carcinogenesis bioassays conducted under the auspices of the National Toxicology Program (NTP) once the NTP formally releases copies of the draft technical reports from those bioassays for peer review by the Technical Report Peer Review Subcommittee of the NTP's Board of Scientific Counselors. This assumption can be made automatically because EPA's Office of Toxic Substances routinely receives complete copies of all draft NTP carcinogenesis bioassay technical reports which are formally released by NTP for peer review.

It cannot be automatically assumed, however, that EPA has been "adequately informed" about the results (including preliminary results) of: 1) NTP carcinogenesis bioassays for which the NTP has not formally released draft technical reports for peer review, and 2) other toxicity studies (i.e. other than carcinogenesis bioassays) performed under the auspices of the NTP or toxicity studies conducted by or for other Federal Agencies. Therefore, a chemical company's receipt of results from toxicologic studies of the types listed in 1) and 2) above should and in most cases does trigger immediate evaluation with consideration then given for reporting appropriate information to EPA pursuant to TSCA Section 8(e). It should be noted that EPA has correctly received many Section 8(e) submissions (usually comprised of a maximum of 1 to 2 pages) that have been filed by companies who have obtained toxicologic information from studies conducted by or for other Federal Agencies. It should also be noted that in those situations involving such TSCA Section 8(e) submissions, EPA's Office of Toxic Substances has immediately initiated appropriate followup activities directly with those other Agencies. These EPA followup actions have minimized and in most cases eliminated any further TSCA Section 8(e) reporting obligation on the part of the submitting companies to provide items such as complete copies of supporting data or actual technical reports.

Therefore, considering that 1) the NTP draft report on ethyl acrylate that was received by the Union Carbide Corporation had not been formally released by National Toxicology Program for peer review by the Technical Report Peer Review Subcommittee of NTP's Board of Scientific Counselors, and 2) the toxicologic (e.g., oncogenicity) information on ethyl acrylate as presented by Union Carbide does provide reasonable support for a conclusion of substantial risk of injury to health as defined in EPA's March 16, 1978, Section 8(e) policy statement, the obtained information was appropriate for submission pursuant to TSCA Section 8(e).

Several TSCA Section 8(e) and "For Your Information (FYI)" submissions on ethyl acrylate and other acrylate compounds have been received and reviewed by EPA. In addition, the Chemical Hazard Identification Branch has prepared Chemical Hazard Information Profiles (CHIPs) on several acrylates including ethyl acrylate. At the present time, the OTS Existing Chemicals Task Force (ECTF) is considering the need for further OTS activities on certain acrylate compounds.

a) The Chemical Hazard Identification Branch (CHIB/AD/EPA) will request the National Toxicology Program to provide EPA with a copy of the subject draft NTP bioassay report on ethyl acrylate. Both the Union Carbide Corporation submission and the draft NTP bioassay report on ethyl acrylate will be provided to the OTS Existing Chemicals Task Force (ECTF).

b) A copy of this status report will be transmitted to OSHA, NIOSH, CPSC, FDA, NTP, OANR/EPA, ORD/EPA, OW/EPA, OSWER/-EPA, and to the OTS Existing Chemicals Task Force. In addition, the status report will be provided to the Office of Toxics Integration (OTI/OPTS/EPA) and Industry Assistance Office (IAO/OTS/EPA) for appropriate distribution.

APPENDIX A.

federal register

THURSDAY, MARCH 16, 1978
PART V

THE NATIONAL ARCHIVES OF THE UNITED STATES
1934

ENVIRONMENTAL PROTECTION AGENCY

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TOXIC SUBSTANCES CONTROL ACT

Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk

[6560-01]

ENVIRONMENTAL PROTECTION AGENCY

[FRL 849-2]

TOXIC SUBSTANCES CONTROL ACT

Notification of Substantial Risk Under Section 8(e)

AGENCY: Environmental Protection Agency.

ACTION: Statement of interpretation and enforcement policy.

SUMMARY: This action states EPA's interpretation of, and enforcement policy concerning, section 8(e) of the Toxic Substances Control Act (TSCA) (90 Stat. 2029, 15 U.S.C. 2607). The provisions of that section went into effect on January 1, 1977.

Section 8(e) states that "any person who manufactures, processes, or distributes in commerce a chemical substance or mixture and who obtains information which reasonably supports the conclusion that such substance or mixture presents a substantial risk of injury to health or the environment shall immediately inform the Administrator of such information unless such person has actual knowledge that the Administrator has been adequately informed of such information."

DATES: The policy expressed in this document is in effect as of the date of publication.

FOR FURTHER INFORMATION CONTACT:

Frank D. Kover, Assessment Division, Office of Toxic Substances (WH-557), Environmental Protection Agency, 401 M Street SW., Washington, D.C. 20460, 202-755-2110.

SUPPLEMENTARY INFORMATION: On September 9, 1977, the Agency proposed guidance (42 FR 45362) on its interpretation of and policy concerning the provisions of section 8(e). Although the proposed "guidance" was an interpretive rule and statement of policy exempt from the notice and public comment provisions of the Administrative Procedure Act (5 U.S.C. 553), the Agency solicited comments on several issues to make more informed decisions. On October 11, the comment period was extended from October 15 to October 31, 1977 (42 FR 54857). On November 4, 1977, a supplemental notice to the proposed guidance was published (42 FR 57744), deleting the November 15 date for reporting certain information obtained before 1977 and stating that a new date would be established in the final guidance.

In developing this policy statement, two meetings have been held (February 1, 1977, and October 26, 1977) with selected representatives of industry and environmental and other interested groups. Comments submitted pursuant to the February 1 meeting were addressed in the preamble to the September 9 proposal. Over 100 written comments have been submitted pursuant to the September 9 proposal from trade associations, businesses, environmental groups, labor unions, State and Federal agencies, and other interested parties. Appendix B describes significant issues raised in these comments and the Agency's response to them.

The major modifications to the September 9 proposal are summarized in points 1 through 7 below.

(1) Pursuant to some question over the definition and nature of "guidance," this document is now described more accurately as a "policy statement." It is exempt from the notice and public comment provisions of the Administrative Procedure Act, as well as provisions concerning delayed effective dates.

(2) Many commenters expressed the view that to apply these requirements to officers and employees of a business organization would result in ill-considered, premature reports and would unfairly subject employees to conflicting responsibilities as individual respondents and as corporate agents. Other commenters expressed support for the view that certain employees have a responsibility to report pertinent information, and felt that the phrase "capable of appreciating pertinent information" appropriately described those employees.

The September 9 proposal would have applied section 8(e) requirements to commercial establishments as well as to employees capable of appreciating pertinent information, but stipulated enforcement priorities intended to encourage corporate processing and centralized reporting of such information (42 FR 45363). The intent was to ensure that pertinent information obtained by employees is promptly and appropriately considered, while minimizing duplicative or ill-considered submissions.

The Agency now feels that these objectives would best be served by allowing commercial establishments—under certain conditions designed to ensure full disclosure—to assume exclusive responsibility for reporting to EPA any substantial-risk information obtained by individual officers or employees. Accordingly, this policy statement stipulates that individual officers and employees will have fully discharged their section 8(e) obligations once they have notified the designated responsible company supervisor or official of pertinent information, *provided*, that the employing company or firm has established, internally publicizes, and affirmatively implements procedures governing such notifications. These procedures, at a minimum, must: (1) Specify the information that must be reported; (2) indicate how the notifications are to be prepared and submitted; (3) note the Federal penalties for failing to report; and (4) provide a mechanism for promptly notifying officers and employees who have submitted reports of the company's disposition of those reports, including whether or not they were submitted to EPA (and if not, informing employees of their right to report to EPA, as protected by TSCA section 23). EPA believes these four criteria will ensure prompt and appropriate processing of pertinent information.

Establishment of such procedures notwithstanding, all officials responsible and having authority for the organization's execution of its section 8(e) obligations retain personal liability for ensuring that substantial-risk information is reported to EPA.

(3) The September 9 proposal stated, in Part III, that a person obtains information when he is aware that it "may suggest" substantial risk. Numerous commenters questioned the Administrator's authority to compel the reporting of information which "may suggest" substantial risk. The Administrator agrees that section 8(e) addresses information that "reasonably supports the conclusion" of substantial risk and has deleted the "may suggest" provision, but emphasizes that "reasonably supports the conclusion" of substantial risk is not identical to a conclusive demonstration of substantial risk. The former typically occurs, and must be reported, at an earlier stage. Part VI in this policy statement provides Agency interpretation of the types of information that "reasonably support" such a conclusion.

(4) Numerous commenters requested clarification of different aspects of Part V of the September 9 proposal ("Information Which Reasonably Supports a Conclusion of Substantial Risk"), particularly concerning environmental effects, and suggested different interpretations of what constitutes a "substantial risk". The Agency continues to focus in this policy statement on the effects set forth in the September 9 proposal, but clarifies that the substantiality of a risk is a function of both the seriousness of the effect and the probability of its occurrence (see Part V).

(5) Numerous commenters maintained that section 8(e) only applies prospectively to information obtained after January 1, 1977. The Agency disagrees, as explained in the preamble to the September 9 proposal. This policy statement continues to apply section 8(e) to information obtained before 1977 of which a person has

been aware since January 1, 1977. In response to requests for clarification, the statement defines what constitutes such awareness. In this manner, EPA intends to limit the need for searches of historical records and files.

(6) This policy statement now provides that any information published in scientific literature, in any language, is exempt if it is referred to in abstracts published by specified abstracting services.

(7) This policy statement describes in a new Part X how to submit claims of confidentiality.

Accordingly, the Administrator's interpretation of and policy towards section 8(e) is set forth below.

Dated: February 24, 1978.

DOUGLAS COSTLE
Administrator.

I. DEFINITIONS

The definitions set forth in TSCA section 3 apply to these requirements. In addition, the following definitions are provided for purposes of this policy statement:

The term "manufacture or process 'for commercial purposes' " means to manufacture or process: (1) For distribution in commerce, including for test marketing purposes, (2) for use as a catalyst or an intermediate, (3) for the exclusive use by the manufacturer or processor, or (4) for product research and development.

The term "person" includes any natural person, corporation, firm, company, joint-venture, partnership, sole proprietorship, association, or any other business entity, any State or political subdivision thereof, any municipality, any interstate body and any department, agency, or instrumentality of the Federal Government.

The term "substantial-risk information" means information which reasonably supports the conclusion that a chemical substance or mixture presents a substantial risk of injury to health or the environment.

II. PERSONS SUBJECT TO THE REQUIREMENT

Persons subject to section 8(e) requirements include both natural persons and business entities engaged in manufacturing, processing, or distributing in commerce a chemical substance or mixture. In the case of business entities, the president, chief executive officer, and any other officers responsible and having authority for the organization's execution of its section 8(e) obligations must ensure that the organization reports substantial-risk information to EPA. The business organization is considered to have obtained any information which any officer or employee capable of appreciating the significance of that information has obtained. It is therefore incumbent upon business organizations to establish procedures for expeditiously processing pertinent information in order to comply with the schedule set forth in Part IV.

Those officers and employees of business organizations who are capable of appreciating the significance of pertinent information are also subject to these reporting requirements. An employing organization may relieve its individual officers and employees of any responsibility for reporting substantial-risk information directly to EPA by establishing, internally publicizing, and affirmatively implementing procedures for employee submission and corporate processing of pertinent information. These procedures, at a minimum, must: (1) Specify the information that officers and employees must submit; (2) indicate how such submissions are to be prepared and the company official to whom they are to be submitted; (3) note the Federal penalties for failing to report; and (4) provide a mechanism for promptly advising officers and employees in writing of the company's disposition of the report, including whether or not the report was submitted to EPA (and if not informing employees of their right to report to EPA, as protected by TSCA section 23). An employee of any company that has established and publicized such procedures, who has internally submitted pertinent information in accordance with them, shall have discharged his section 8(e) obligation. Establishment of such procedures notwithstanding, all officials responsible and having authority for the organization's execution of its section 8(e) obligations retain personal liability for ensuring that the appropriate substantial-risk information is reported to EPA.

Business organizations that do not establish such procedures cannot relieve their individual officers and employees of the responsiblity for ensuring that substantial-risk information they obtain is reported to EPA. While officers and employees of such organizations may also elect to submit substantial-risk information to their superiors for corporate processing and reporting, rather than to EPA directly, they have not discharged their individual section 8(e) obligation until EPA has received the information.

NOTE.—Irrespective of a business organization's decision to establish and publicize the procedures described above, it is responsible for becoming cognizant of any substantial-risk information obtained by its officers and employees, and for ensuring that such information is reported to EPA within 15 working days.

III. WHEN A PERSON WILL BE REGARDED AS HAVING OBTAINED INFORMATION

A person obtains substantial-risk information at the time he first comes into possession of or knows of such information.

NOTE.—This includes information of which a prudent person similarly situated could reasonably be expected to possess or have knowledge.

An establishment obtains information at the time any officer or employee capable of appreciating the significance of such information obtains it.

IV. REQUIREMENT THAT A PERSON "IMMEDIATELY INFORM" THE ADMINISTRATOR

With the exception of information on emergency incidents of environmental contamination [see Part V(c)] a person has "immediately informed" the Administrator if information is received by EPA not later than the 15th working day after the date the person obtained such information. Supplementary information generated after a section 8(e) notification should, if appropriate, be immediately reported. For emergency incidents of environmental contamination, a person shall report the incident to the Administrator by telephone as soon as he has knowledge of the incident (see Part IX for appropriate telephone contacts). The report should contain as much of the information required by Part IX as possible. A written report in accordance with Part IX (a) through (f) is to be submitted within 15 days.

Information currently in the possession of a person who is subject to reporting must be reported within 60 days of publication of this policy statement.

V. WHAT CONSTITUTES SUBSTANTIAL RISKS

A "substantial risk of injury to health or the environment" is a risk of considerable concern because of (a) the seriousness of the effect [see Subparts (a), (b), and (c) below for an illustrative list of effects of concern], and (b) the fact or probability of its occurrence. (Economic or social benefits of use, or costs of restricting use, are not to be considered in determining whether a risk is "substantial".) These two criteria are differentially weighted for different types of effects. The human health effects listed in Subpart (a) below, for example, are so serious that relatively little weight is given to exposure; the mere fact the implicated chemical is in commerce constitutes sufficient evidence of exposure. In contrast, the remaining effects listed in Subparts (b) and (c) below must involve, or be accompanied by the potential for, significant levels of exposure (because of general production levels, persistence, typical uses, common means of disposal, or other pertinent factors).

Note that: (i) The effects outlined below should not be reported if the respondent has actual knowledge that the Administrator is already informed of them.

(ii) Information respecting these effects can be obtained either directly, by observation of their occurrence, or inferred from designed studies as discussed in Part VI.

The Agency considers effects for which substantial-risk information must be reported to include the following:

(a) *Human health effects*—(1) Any instance of cancer, birth defects, mutagenicity, death, or serious or prolonged incapacitation, including the loss of or inability to use a normal bodily function with a consequent relatively serious impairment of normal activities, if one (or a few) chemical(s) is strongly implicated.

(2) Any pattern of effects or evidence which reasonably supports the conclusion that the chemical substance or mixture can produce cancer, mutation, birth defects or toxic effects resulting in death, or serious or prolonged incapacitation.

(b) *Environmental effects*—(1) Widespread and previously unsuspected distribution in environmental media, as indicated in studies (excluding materials contained within appropriate disposal facilities).

(2) Pronounced bioaccumulation. Measurements and indicators of pronounced bioaccumulation heretofore unknown to the Administrator (including bioaccumulation in fish beyond 5,000 times water concentration in a 30-day exposure or having an n-octanol/water partition coefficient greater than 25,000) should be reported when coupled with potential for widespread exposure and any non-trivial adverse effect.

(3) Any non-trivial adverse effect, heretofore unknown to the Administrator, associated with a chemical known to have bioaccumulated to a pronounced degree or to be widespread in environmental media.

(4) Ecologically significant changes in species' interrelationships; that is, changes in population behavior, growth, survival, etc. that in turn affect other species' behavior, growth, or survival.

Examples include: (i) Excessive stimulation of primary producers (algae, macrophytes) in aquatic ecosystems, e.g., resulting in nutrient enrichment, or eutrophication, of aquatic ecosystems.

(ii) Interference with critical biogeochemical cycles, such as the nitrogen cycle.

(5) Facile transformation or degradation to a chemical having an unacceptable risk as defined above.

(c) *Emergency incidents of environmental contamination*—Any environmental contamination by a chemical substance or mixture to which any of the above adverse effects has been ascribed and which because of the pattern, extent, and amount of contamination (1) seriously threatens humans with cancer, birth defects, mutation, death, or serious or prolonged incapacitation, or (2) seriously threatens non-human organisms with large-scale or ecologically significant population destruction.

VI. Nature and Sources of Information Which "Reasonably Supports the Conclusion" of Substantial Risk

Information attributing any of the effects described in Part V above to a chemical substance or mixture is to be reported if it is one of the types listed below and if it is not exempt from the reporting requirement by reason of Part VII of this policy statement. A person is not to delay reporting until he obtains conclusive information that a substantial risk exists, but is to immediately report any evidence which "reasonably supports" that conclusion. Such evidence will generally not be conclusive as to the substantiality of the risk; it should, however, reliably ascribe the effect to the chemical.

Information from the following sources concerning the effects described in Part V will often "reasonably support" a conclusion of substantial risk. Consideration of corroborative information before reporting can only occur where it is indicated below.

(1) *Designed, controlled studies.* In assessing the quality of information, the respondent is to consider whether it contains reliable evidence ascribing the effect to the chemical. Not only should final results from such studies be reported, but also preliminary results from incomplete studies where appropriate. Designed, controlled studies include:

(i) In vivo experiments and tests.

(ii) In vitro experiments and tests. Consideration may be given to the existence of corroborative information, if necessary to reasonably support the conclusion that a chemical presents a substantial risk.

(iii) Epidemiological studies.

(iv) Environmental monitoring studies.

(2) *Reports concerning and studies of undesigned, uncontrolled circumstances.* It is anticipated here that reportable effects will generally occur in a pattern, where a significant common feature is exposure to the chemical. However, a single instance of cancer, birth defects, mutation, death, or serious incapacitation in a human would be reportable if one (or a few) chemical(s) was strongly implicated. In addition, it is possible that effects less serious than those described in Part V(a) may be preliminary manifestations of the more serious effects and, together with another triggering piece of information, constitute reportable information; an example would be a group of exposed workers experiencing dizziness together with preliminary experimental results demonstrating neurological dysfunctions.

Reports and studies of undesigned circumstances include:

(i) Medical and health surveys.

(ii) Clinical studies.

(iii) Reports concerning and evidence of effects in consumers, workers, or the environment.

VII. Information Which Need Not Be Reported

Information need not be reported if it:

(a) Has been published by EPA in reports;

(b) Has been submitted in writing to EPA pursuant to mandatory reporting requirements under TSCA or any other authority administered by EPA (including the Federal Insecticide, Fungicide and Rodenticide Act, the Clean Air Act, the Federal Water Pollution Control Act, the Marine Protection, Research, and Sanctuaries Act, the Safe Drinking Water Act, and the Resource Conservation and Recovery Act), provided that the information: (1) Encompasses that required by Part IX (c) through (f); and (2) is from now on submitted within the time constraints set forth in Part IV and identified as a section 8(e) notice in accordance with Part IX(b);

(c) Has been published in the scientific literature and referenced by the following abstract services: (1) Agricola, (2) Biological Abstracts, (3) Chemical Abstracts, (4) Dissertation Abstracts, (5) Index Medicus, (6) National Technical Information Service.

(d) Is corroborative of well-established adverse effects already documented in the scientific literature and referenced as described in (c) above, unless such information concerns emergency incidents of environmental contamination as described in Part V(c), or

(e) Is contained in notification of spills under section 311(b)(5) of the Federal Water Pollution Control Act.

VIII. Information First Received by a Person Prior to the Effective Date of TSCA

Any substantial risk information possessed by a person prior to January 1, 1977, of which he is aware after that date shall be reported within 60 days of publication of this policy statement. The Agency considers that a person is "aware" of:

(a) Any information reviewed after January 1, 1977, including not only written reports, memoranda and other documents examined after January 1, 1977, but also information referred to in discussions and conferences in which the person participated after January 1, 1977;

(b) Any information the contents of which a person has been alerted to by date received after January 1, 1977, including any information concerning a chemical for which the person is presently assessing health and environmental effects;

(c) Any other information of which the person has actual knowledge.

IX. REPORTING REQUIREMENTS

Notices shall be delivered to the Document Control Officer, Chemical Information Division, Office of Toxic Substances (WH-557), Environmental Protection Agency, 401 M Street SW., Washington, D.C. 20460.

A notice should:

(a) Be sent by certified mail, or in any other way permitting verification of its receipt by the Agency,

(b) State that it is being submitted in accordance with section 8(e),

(c) Contain the job title, name, address, telephone number, and signature of the person reporting and the name and address of the manufacturing, processing, or distributing establishment with which he is associated,

(d) Identify the chemical substance or mixture (including, if known, the CAS Registry Number),

(e) Summarize the adverse effects being reported, describing the nature and the extent of the risk involved, and

(f) Contain the specific source of the information together with a summary and the source of any available supporting technical data.

For emergency incidents of environmental contamination (see Part V(c)), a person shall report the incident to the Administrator by telephone as soon as he has knowledge of the incident (see below for appropriate telephone contacts). The report should contain as much of the information required by instructions (b) through (f) above as possible. A written report, in accordance with instructions (a) through (f) above, is to be submitted within 15 days. Twenty-four hour emergency telephone numbers are:

Region I (Maine, Rhode Island, Connecticut, Vermont, Massachusetts, New Hampshire), 617-223-7265.
Region II (New York, New Jersey, Puerto Rico, Virgin Islands), 201-548-8730.
Region III (Pennsylvania, West Virginia, Virginia, Maryland, Delaware, District of Columbia), 215-597-9898.
Region IV (Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Florida), 404-881-4062.
Region V (Wisconsin, Illinois, Indiana, Michigan, Ohio, Minnesota), 312-353-2318.
Region VI (New Mexico, Texas, Oklahoma, Arkansas, Louisiana), 214-749-3840.
Region VII (Nebraska, Iowa, Missouri, Kansas), 816-374-3778.
Region VIII (Colorado, Utah, Wyoming, Montana, North Dakota, South Dakota), 303-837-3880.
Region IX (California, Nevada, Arizona, Hawaii, Guam), 415-556-6254.
Region X (Washington, Oregon, Idaho, Alaska), 206-442-1200.

X. CONFIDENTIALITY CLAIMS

(a) Any person submitting a notice to EPA under section 8(e) of TSCA may assert a business confidentiality claim covering all or part of the information contained in the notice. Any information covered by a claim will be disclosed by EPA only to the extent, and by means of the procedures, set forth in 40 CFR Part 2 (41 FR 36902, September 1, 1976).

(b) If no claim accompanies the notice at the time it is submitted to EPA, the notice will be placed in an open file to be available to the public without further notice to the submitter.

(c) To assert a claim of confidentiality for information contained in a notice, the submitter must submit two copies of the notice.

(1) One copy must be complete. In that copy the submitter must indicate what information, if any, is claimed as confidential by marking the specified information on each page with a label such as "confidential," "proprietary," or "trade secret."

(2) If some information in the notice is claimed as confidential, the submitter must submit a second copy. The second copy must be complete except that all information claimed as confidential in the first copy must be deleted.

(3) The first copy of the notice will be disclosed by EPA only to the extent, and by means of the procedures, set forth in 40 CFR Part 2. The second copy will be placed in an open file to be available to the public.

(d) Any person submitting a notice containing information for which they are asserting a confidentiality claim should send the notice in a double envelope.

(1) The outside envelope should bear the same address outlined in section IX of this policy statement.

(2) The inside envelope should be clearly marked "To be opened only by the OTS Document Control Officer."

XI. FAILURE TO REPORT INFORMATION

Section 15(3) of TSCA makes it unlawful for any person to fail or refuse to submit information required under section 8(e). Section 16 provides that a violation of section 15 renders a person liable to the United States for a civil penalty and possible criminal prosecution. Pursuant to section 17, the Government may seek judicial relief to compel submittal of section 8(e) information and to otherwise restrain any violation of section 8(e).

APPENDIX A.—QUICK REFERENCE SUMMARY FOR EMERGENCY INCIDENTS OF ENVIRONMENTAL CONTAMINATION

A. WHAT SHOULD BE REPORTED AS AN EMERGENCY INCIDENT

An emergency incident of environmental contamination is "any environmental contamination by a chemical substance or mixture . . . which, because of the pattern, extent and amount of contamination, (1) Seriously threatens humans with cancer, birth defects, mutation, death, or serious or prolonged incapacitation, or (2) seriously threatens non-human organisms with large scale or ecologically significant population destruction". (See Part V(c) for complete description.)

B. WHAT NEED NOT BE REPORTED AS AN EMERGENCY INCIDENT

Information contained in notification of spills under section 311(b)(5) of the Federal Water Pollution Control Act (FWPCA). (For a complete list of exemptions to reporting, see Part VII.)

C. WHEN AND WHERE TO REPORT EMERGENCY INCIDENTS

Emergency incidents of environmental contamination are to be reported immediately by telephone to the appropriate EPA Regional 24-hour telephone emergency line listed below.

Region I (Maine, Rhode Island, Connecticut, Vermont, Massachusetts, New Hampshire), 617-223-7265.
Region II (New York, New Jersey, Puerto Rico, Virgin Islands), 201-548-8730.
Region III (Pennsylvania, West Virginia, Virginia, Maryland, Delaware, District of Columbia), 215-597-9898.
Region IV (Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Florida), 404-881-4062.
Region V (Wisconsin, Illinois, Indiana, Michigan, Ohio, Minnesota), 312-353-2318.
Region VI (New Mexico, Texas, Oklahoma, Arkansas, Louisiana), 214-749-3840.
Region VII (Nebraska, Iowa, Missouri, Kansas), 816-374-3778.
Region VIII (Colorado, Utah, Wyoming, Montana, North Dakota, South Dakota), 303-837-3880.
Region IX (California, Nevada, Arizona, Hawaii, Guam), 415-556-6254.
Region X (Washington, Oregon, Idaho, Alaska), 206-442-1200.

In addition, a written report, in accordance with instructions (a) through (f) of Part IX, is to be submitted within 15 days to the Document Control Officer, Chemical Information Division, Office of Toxic Substances (WH-557), 401 M Street SW., Washington, D.C. 20460.

APPENDIX B—SIGNIFICANT COMMENTS AND RESPONSES

A. PERSONS SUBJECT TO THESE REQUIREMENTS

Comment 1: Employees cannot be held subject to these requirements, since: (a) They only have a partial role in the manufacture, processing, or distribution of chemicals, (b) in other sections of TSCA, the term "person who manufactures, processes, or distributes" chemicals clearly refers to business organizations; "persons" should be consistently defined, and (c) the application of criminal penalties mandates a strict interpretation of this word

Response: The Agency considers that different sections of TSCA, having different purposes, are appropriately directed to different respondents. In the case of section 8(e), officers and employees who are capable of appreciating the significance of information have a legitimate responsibility to be alert to and report substantial-risk information. The guidance has been modified so that natural persons and business entities can fulfill their section 8(e) obligations in different ways. Most officers and employees can discharge their section 8(e) obligations by submitting pertinent information to corporate superiors, provided that the company has established the risk-evaluation procedures characterized in Part II. In the case of a business organization, its president, chief executive officer, and other officials responsible and having authority for the business organization's execution of its section 8(e) obligations must ensure that the organization reports substantial-risk information to EPA.

Comment 2: Even if employees can be held subject to these requirements, they should not be. To do so would force employees and employers into conflicting positions, inviting internal corporate dissension and over- reporting. Further, individuals often do not have the overview necessary to reach considered, well-supported decisions. Corporate reporting by designated officials will provide EPA with more reliable data.

Response: The Agency considers that employees have a legitimate role in risk reporting; it is imperative that risk information obtained by employees be appropriately considered. Officers and employees can fulfill their role in the reporting of substantial-risk information, without the disadvantages described above, by reporting information to superiors for corporate consideration, and, having done so, will have discharged their obligation to EPA. This is contingent upon the establishment by the business organization of certain procedures for risk-evaluation, thereby assuring the appropriate consideration of such reports. Those officers responsible and having authority for the organization's execution of its section 8(e) obligations must ensure that the organization reports substantial-risk information to EPA.

Comment 3: Clarify which employees are covered, and the extent of their obligation. Are employees "capable of appreciating pertinent information" by virtue of rank, or knowledge? Are rank and file employees subject to these requirements, or just supervisory and managerial personnel, company toxicologists, etc.? Is an employee absolved of further responsibility if he reports to his supervisor?

Response: The Agency considers that the phrase "capable of appreciating the significance of pertinent information" appropriately describes those officers and employees who have a responsibility to be alert to and report substantial-risk information, including not only relatively senior corporate officers but also many corporate employees. The policy statement modifies the September 9 proposal, in response to the concerns expressed in Comments 2 and 3, to permit most officers and employees to discharge their obligation by submitting information to corporate superiors, subject to the conditions described in Part II.

Comment 4: Consultants and independent labs should not be subject to these requirements.

Response: Contractors and independent labs are not responsible for reporting information they have obtained directly to EPA; rather, their client manufacturers, processors and distributors are responsible for reporting such information.

B. THE "OBTAINING" OF INFORMATION

Comment 5: The "may suggest" criterion in Part III of the proposal serves to compel further examination of information that by itself is not subject to section 8(e) requirements. The statutory language calling for "reasonable support" does not support this. Further, risk assessment often requires anywhere from months to several years of study after preliminary results "suggest" risk, far exceeding the 15-day compliance period.

Response: The Agency does not intend to compel under section 8(e) examination of information that by itself is not subject to section 8(e) requirements and has deleted the "may suggest" provision, providing its interpretation of what constitutes evidence that "reasonably supports the conclusion" of substantial risk in a new Part VI.

Comment 6: Section 8(e) obligations are incurred upon obtaining conclusory substantial-risk information.

Response: The Agency disagrees, and considers that "reasonable support" of a conclusion of substantial risk is not identical to the conclusion itself. The former typically occurs, and must be reported, at an earlier stage.

Comment 7: The statement, in Part III of the proposal that a person has obtained information if he ". . . should know of the existence of such information not in his possession but which would be delivered to him on request," tends to compel an active search for substantial-risk information rather than the reporting of substantial-risk information a person "obtains." This is of particular concern to importers with limited access to information possessed by their suppliers.

Response: The Agency considers that section 8(e) applies to information which a person possesses or of which he knows. It is not intended to compel searches for information or extraordinary efforts to acquire information. The Agency further considers, however, that "known" information includes information which a prudent person similarly situated could reasonably be expected to know. Negligence or intentional avoidance of information does not absolve a person of his section 8(e) obligation. Part III has been modified to express these intentions.

Comment 8: Circumstances can exist when coming "into possession" of risk information does not correspond to an understanding of the implications of the information; "obtains" should be defined in terms of possession of information and awareness of its import.

Response: The "obtaining" of information occurs via persons who are "capable of appreciating the significance of pertinent information." There will likely be circumstances in which the evaluation of information clarifies its full import; the establishment of corporate procedures for processing risk-information prescribed in Part II will expedite this.

C. TIME ALLOWED FOR COMPLIANCE

Comment 9: Fifteen calendar days is insufficient to determine whether information which "may suggest" substantial risk should be reported; it is even insufficient to accommodate normal procedural time constraints (corporate processing, mailing, holidays, etc.).

Response: The Agency has changed the compliance period to 15 business days. It is imperative that procedures be established to expedite the reporting of substantial-risk information, not that reporting conform to existing procedures.

Comment 10: Allow from 30 to 90 days for the second phase of reporting; alternatively, do not prescribe a time limit for additional reporting.

Response: Having deleted the "may suggest" criterion, the Agency sees no need to provide a second phase to the reporting period. Supplemental information that is generated after a section 8(e) notification should, if appropriate, be immediately reported.

Comment 11: Allow from 30 to 120 days to report pre-1977 information; this period should commence: (a) upon final publication, (b) January 1, 1978, (c) following the inventory reporting period since many of the same corporate personnel will be implementing both requirements.

Response: The policy statement prescribes a 60 day reporting period, commencing immediately upon publication. Section 8(e) has been in effect since January 1, 1977; postponement in reporting substantial-risk information is not warranted.

D. EFFECTS AND INFORMATION THAT MUST BE REPORTED

Comment 12: The reporting of "any instance" of cancer, birth defects, etc., in humans is too broad and such information will be of little use; chemical workers, like the general population, develop cancers and other ailments of uncertain etiology.

Response: This policy statement clarifies that the reporting of single occurrences of human cancer or other serious effects will depend upon evidence strongly implicating one (or a few) chemical(s).

Comment 13: Dermal ailments and nausea are poorly chosen examples of precursor symptoms. Deleting these examples will avoid unduly emphasizing them when other symptoms may be more important, yet will not eliminate the obligation to report them if they are suspected precursors.

Response: The Agency agrees.

Comment 14: How are reportable data distinguished from routine tests including range tests such as LD_{50}'s?

Response: This policy statement directs the reporting of specified effects when unknown to the Administrator. Many routine tests are based on a knowledge of toxicity associated with a chemical; unknown effects occurring during such a range test may have to be reported if they are those of concern to the Agency and if the information meets the criteria set forth in Parts V and VI.

Comment 15: The most widespread "in vitro" test is the Ames test, which is subject to considerable debate. Clarify the circumstances under which positive results of in vitro tests must be reported.

Response: Part VI clarifies that the reporting of in vitro tests will depend upon the existence of corroborative information if necessary to reasonably support the conclusion of substantial risk.

Comment 16: The description of "extreme persistence" as a substantial risk is an example of the need to redefine Part V(c) ("Environmental Effects"). Persistence and bioaccumulation should be considered risks only when coupled with toxicity and significant exposure.

Response: Part V now clarifies those effects for which reporting depends upon a significant exposure potential. Persistence by itself is no longer itemized as a reportable effect but rather is considered to be a component of exposure potential; it may also underlie the measurements described in Part V(b)(1). Laboratory indicators of pronounced bioaccumulation are to be reported when coupled with potential for widespread exposure and any non-trivial adverse effect.

Comment 17: The n-octanol/water partition coefficient addresses a physico-chemical property, not biological effects, and is not alone an indicator of substantial risk; further, the values stated for the coefficient and the bioaccumulation factor in fish do not correspond.

Response: The Agency acknowledges the numerical error and has amended the values to correspond. This policy statement now directs the reporting of an experimental measurement of bioaccumulation when coupled with an adverse effect and potential for widespread exposure.

Comment 18: The requirement that information which "links" an effect to a chemical be reported is too broad and contradicts the statutory language of "reasonably supports".

Response: The Agency has provided in a new Part VI its interpretation of "reasonably supports".

Comment 19: A determination that information "reasonably supports the conclusion" of substantial risk cannot be made independently of considerations of use since the method and manner of using a chemical may influence the occurrence of an effect; in particular, the criteria should reflect a distinction between normal and abnormal uses of chemicals.

Response: The Agency considers that the appropriate components of a "substantial risk" with respect to a chemical are (a) the seriousness of the effect, and (b) total exposure potential. The method and manner of using a chemical is one of several factors determining its exposure potential. As described in Part V, the importance of exposure potential as a component of "substantial risk" depends upon the kind of effect of concern. Thus, the effects described in Part V(a) are so serious that relatively little weight is given to exposure; the effects described in Parts V (b) and (c) involve a significant exposure or exposure potential.

The Agency further considers that a definition of "normal" use for a particular chemical will often depend upon a knowledge of the risks associated with the chemical.

E. INFORMATION THAT NEED NOT BE REPORTED

Comment 20: Information published in scientific literature in languages other than English should be exempted if published in summary form by abstracting services. Can the accuracy of English language abstracts and commercial translations of foreign literature be assumed?

Response: This policy statement now provides that information published in scientific literature, whether in English or another language, is exempt from reporting if published in summary form by certain specified abstract services.

Comment 21: Information exchange systems with other Federal agencies should be immediately established so that respondents need not report to EPA information already reported to other Agencies, and vice versa. Such duplicative reports are unduly burdensome.

Response: EPA is coordinating this program with other agencies now. When this coordination is successfully completed, the policy statement will be amended to exempt from the reporting requirement information that has been submitted to other specified agencies. In the meantime, substantial-risk information must be reported directly to EPA; such a report does not discharge any reporting obligation to other agencies.

F. INFORMATION FIRST RECEIVED PRIOR TO THE EFFECTIVE DATE OF TSCA

Comment 22: The tense of the verb "obtains" reveals that section 8(e) was intended to be applied prospectively to information newly acquired after January 1, 1977. Utilize section 8(d) or other rules to acquire information obtained before then.

Response: As discussed in the preamble to the September 9 proposal, the Agency considers section 8(e) to apply to risk information possessed by or known to a person before, on, or after January 1, 1977. Concerning information first obtained before 1977, this policy statement continues to require reporting of information received if a person has been aware of it since January 1, 1977, for the reasons discussed in the September 9 preamble.

Comment 23: The term "aware" is too vague to be of any help in responding to these requirements. Since many corporate employees are potentially subject to these requirements, and given uncertainty over the extent to which they ought to be aware of pre-1977 information, this provision tends to compel the very file search it was intended to avoid. The term "aware" should be further defined, possibly in terms of actual knowledge.

Response: The Agency in Part VIII of this policy statement now defines the pre-1977 information of which a person is considered to be aware.

G. CONFIDENTIAL INFORMATION

Comment 24: EPA should delay guidance until procedures are published governing the treatment of confidential submissions.

Comment 25: EPA should treat all submissions as confidential until the information is verified.

Comment 26: EPA should automatically publish section 8(e) notices.

Response to Comments 24 through 26: EPA has included a new Part X which describes how to submit a claim of confidentiality and states that any or all of the information submitted may be claimed as confidential. Such information will be disclosed by EPA only to the extent, and by means of the procedures, set forth in 40 CFR Part 2.

H. MISCELLANEOUS

Comment 27: What is the statutory basis or need for guidance? What is its exact status under the Administrative Procedure Act?

Response: This policy statement sets forth EPA's interpretation of and policy concerning TSCA section 8(e). As an interpretive rule and statement of policy it is not subject to the comment period and delayed effective date provisions of the Administrative Procedure Act (5 U.S.C. 553). Although TSCA does not mandate a policy statement, the Agency of necessity must develop the criteria which will govern enforcement activities. Trade associations and businesses were among those who previously expressed interest in such a statement to guide their compliance.

Comment 28: Clarify whether these requirements apply to chemicals previously but no longer manufactured, processed, or distributed in commerce by a person.

Response: Information obtained before 1977 must be reported if the person has been aware of it since January 1, 1977, as prescribed by Part VIII. Concerning chemicals which a person has discontinued manufacturing, processing, or distributing since January 1, 1977, information obtained before the time of discontinuation is subject to these requirements. It is expected that the acquisition of information after that time will be minimal; however, should additional information be acquired, it may trigger the reporting described in Part VIII.

Comment 29: Clarify the meaning of "substantial risk" relative to other risks addressed by TSCA.

Response: A substantial risk is defined in Part V(a) of this policy statement as a risk of considerable concern because of (a) the seriousness of the effect, and (b) the fact or probability of its occurrence. As opposed to other risks addressed by TSCA, economic or social benefits of use, or costs of restricting use, are not to be considered in determining whether a risk is "substantial".

Comment 30: To what extent are "users" of chemicals subject to these requirements?

Response: The Agency considers that many industrial uses of chemicals actually fall within the scope of "processing" chemicals. A manufacturer, processor, or distributor who obtains substantial-risk information concerning chemicals he handles should be alert to the possibility he may have to report it.

Comment 31: Are chemicals manufactured, processed and distributed in commerce in small quantities solely for purposes of research and development subject to these requirements?

Response: In general, the Agency considers that much manufacturing, processing, and distribution in commerce of chemicals in small quantities solely for purposes of research and development is conducted for "commercial purposes". Such purposes would include the sale and distribution of such materials, as well as their use by the manufacturer or processor in activities (for example, product research and development and studies assessing the feasibility and safety of using chemicals) preceding his or a client's commercial use of such materials or others on a larger scale.

As described in Part V, the Agency considers that "substantial risks" depend in part upon an exposure potential. Thus, the occurrence of the effects described in Part V(a) presuppose exposure to the chemical and must be reported; reporting of the other effects will depend upon a potential for significant levels of exposure.

Comment 32: Are raw materials, intermediates, and inert ingredients produced or used in the manufacture of a pesticide subject to TSCA?

Response: The Administrator considers that raw materials, intermediates and inert ingredients produced or used in the manufacture of a pesticide are substances or mixtures which can be regulated under TSCA.

In order to be considered a pesticide, a substance must be intended for use as a pesticide. Raw materials, intermediates, and inert ingredients produced or used in the manufacture of a pesticide are not themselves regulated under FIFRA (unless they happen to be pesticides themselves) and, therefore, are subject to TSCA. The pesticide regulations at 40 CFR 162.4 are consistent with this view.

Comment 33: Are intermediates and catalysts intended solely for use in the production of a food, food additive, drug, cosmetic, or device subject to TSCA?

Response: The Administrator considers that intermediates and catalysts intended solely for use in the production of a food, food additive, drug, cosmetic, or device are excluded from regulation under TSCA. The definitions of the FFDCA provide that chemical substances which are intended for use as a component of a food, food additive, drug, cosmetic, or device are encompassed within the meaning of such terms, respectively. The FDA considers intermediates and catalysts to be such components. Therefore, they are subject to regulation under the FFDCA. Any such substance is excluded from regulation under TSCA insofar as it is actually manufactured, processed, or distributed in commerce solely for use in the production of a food, food additive, drug, cosmetic, or device.

Comment 34: Employees should have the option to submit reports anonymously.

Response: EPA considers that any person may report information to EPA under TSCA. Those who are required to do so under section 8(e) are persons who manufacture, process, or distribute in commerce chemical substances or mixtures, including not only business entities but also such employees as described in Part II. In order to establish that such persons have discharged their obligations, and in order to encourage responsible review of the quality of information and the substantiality of risks, EPA believes that notifiers should identify themselves. Section 23 will adequately protect employees from discrimination pursuant to notifications they have made under section 8(e).

[FR Doc. 78-7064 Filed 3-15-78; 8:45 am]

APPENDIX B: STATUS REPORTS BY CAS NUMBER

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CAS NUMBER:  62-75-9                    CHEMICAL NAME: METHANAMINE, N-METHYL-N-NITROSO-
         SUBMISSION #: 8EHQ-1280-0376

CAS NUMBER:  67-63-0                    CHEMICAL NAME: 2-PROPANOL
         SUBMISSION #: 8EHQ-1180-0371

CAS NUMBER:  71-43-2                    CHEMICAL NAME: BENZENE
         SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER:  71-55-6                    CHEMICAL NAME: ETHANE, 1,1,1-TRICHLORO-
         SUBMISSION #: 8EHQ-0980-0365                  8EHQ-0982-0457

CAS NUMBER:  74-87-3                    CHEMICAL NAME: METHANE, CHLORO-
         SUBMISSION #: 8EHQ-1182-0464

CAS NUMBER:  75-01-4                    CHEMICAL NAME: ETHENE, CHLORO-
         SUBMISSION #: 8EHQ-0680-0345                  8EHQ-0982-0457

CAS NUMBER:  75-01-4                    CHEMICAL NAME: VINYL CHLORIDE
         SUBMISSION #: 8EHQ-0680-0345                  8EHQ-0982-0457

CAS NUMBER:  75-09-2                    CHEMICAL NAME: METHANE, DICHLORO-
         SUBMISSION #: 8EHQ-0680-0345
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CAS NUMBER: 75-09-2 CHEMICAL NAME: METHYLENE CHLORIDE
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 75-21-8 CHEMICAL NAME: ETHYLENE OXIDE
SUBMISSION #: 8EHQ-0832-0453

CAS NUMBER: 75-21-8 CHEMICAL NAME: OXIRANE
SUBMISSION #: 8EHQ-0882-0453

CAS NUMBER: 75-34-3 CHEMICAL NAME: ETHANE, 1,1-DICHLORO-
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 75-38-7 CHEMICAL NAME: ETHENE, 1,1-DIFLUORO-
SUBMISSION #: 8EHQ-0480-0337

CAS NUMBER: 75-56-9 CHEMICAL NAME: OXIRANE, METHYL-
SUBMISSION #: 8EHQ-0282-0439

CAS NUMBER: 75-56-9 CHEMICAL NAME: PROPYLENE OXIDE
SUBMISSION #: 8EHQ-0282-0439

CAS NUMBER: 75-71-8 CHEMICAL NAME: METHANE, DICHLORODIFLUORO-
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 75-91-2 CHEMICAL NAME: HYDROPEROXIDE, 1,1-DIMETHYLETHYL
SUBMISSION #: 8EHQ-1081-0415

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CAS NUMBER:  76-06-2                     CHEMICAL NAME: METHANE, TRICHLORONITRO-
         SUBMISSION #: 8EHQ-1081-0416

CAS NUMBER:  77-48-5                     CHEMICAL NAME: 2,4-IMIDAZOLIDINEDIONE, 1,3-DIBROMO-5,5-DIMETHYL-
         SUBMISSION #: 8EHQ-0281-0382

CAS NUMBER:  77-73-6                     CHEMICAL NAME: DICYCLOPENTADIENE
         SUBMISSION #: 8EHQ-0980-0364

CAS NUMBER:  77-73-6                     CHEMICAL NAME: 4,7-METHANO-1H-INDENE, 3A,4,7,7A-TETRAHYDRO-
         SUBMISSION #: 8EHQ-0980-0364

CAS NUMBER:  77-78-1                     CHEMICAL NAME: SULFURIC ACID, DIMETHYL ESTER
         SUBMISSION #: 8EHQ-0482-0442

CAS NUMBER:  79-01-6                     CHEMICAL NAME: ETHENE, TRICHLORO-
         SUBMISSION #: 8EHQ-0680-0345                   8EHQ-0982-0457

CAS NUMBER:  79-01-6                     CHEMICAL NAME: TRICHLOROETHYLENE
         SUBMISSION #: 8EHQ-0680-0345                   8EHQ-0982-0457

CAS NUMBER:  80-08-0                     CHEMICAL NAME: BENZENAMINE, 4,4'-SULFONYLBIS-
         SUBMISSION #: 8EHQ-0480-0338

CAS NUMBER:  80-08-0                     CHEMICAL NAME: DDS
         SUBMISSION #: 8EHQ-0480-0338
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CAS NUMBER: 80-08-0
CHEMICAL NAME: EPORAL
SUBMISSION #: 8EHQ-0480-0338

CAS NUMBER: 81-88-9
CHEMICAL NAME: C. I. BASIC VIOLET 10
SUBMISSION #: 8EHQ-0282-0434

CAS NUMBER: 81-88-9
CHEMICAL NAME: ETHANAMINIUM, N-[9-(2-CARBOXYPHENYL)-6-(DIETHYLAMINO)-3H-XANTHEN-3-YLIDENE]-N-ETHYL-, CHLORIDE
SUBMISSION #: 8EHQ-0282-0434

CAS NUMBER: 81-88-9
CHEMICAL NAME: D&C RED NO. 19
SUBMISSION #: 8EHQ-0282-0434

CAS NUMBER: 81-88-9
CHEMICAL NAME: RHODAMINE B
SUBMISSION #: 8EHQ-0282-0434

CAS NUMBER: 86-28-2
CHEMICAL NAME: 9H-CARBAZOLE, 9-ETHYL-
SUBMISSION #: 8EHQ-1080-0368

CAS NUMBER: 87-84-3
CHEMICAL NAME: CYCLOHEXANE, 1,2,3,4,5-PENTABROMO-6-CHLORO-
SUBMISSION #: 8EHQ-0381-0393

CAS NUMBER: 91-66-7
CHEMICAL NAME: BENZENAMINE, N,N-DIETHYL-
SUBMISSION #: 8EHQ-0282-0430 *

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 93-55-0   CHEMICAL NAME: 1-PROPANONE, 1-PHENYL-
SUBMISSION #: 8EHQ-0580-0341

CAS NUMBER: 95-50-1   CHEMICAL NAME: BENZENE, 1,2-DICHLORO-
SUBMISSION #: 8EHQ-1080-0368

CAS NUMBER: 95-53-4   CHEMICAL NAME: BENZENAMINE, 2-METHYL-
SUBMISSION #: 8EHQ-0680-0348

CAS NUMBER: 95-53-4   CHEMICAL NAME: TOLUIDINE (ORTHO)
SUBMISSION #: 8EHQ-0680-0348

CAS NUMBER: 95-76-1   CHEMICAL NAME: BENZENAMINE, 3,4-DICHLORO-
SUBMISSION #: 8EHQ-0981-0409

CAS NUMBER: 95-80-7   CHEMICAL NAME: 1,3-BENZENEDIAMINE, 4-METHYL-
SUBMISSION #: 8EHQ-1080-0367

CAS NUMBER: 98-07-7   CHEMICAL NAME: BENZENE, (TRICHLOROMETHYL)-
SUBMISSION #: 8EHQ-0980-0360
8EHQ-0582-0444

CAS NUMBER: 98-51-1   CHEMICAL NAME: BENZENE, 1-(1,1-DIMETHYLETHYL)-4-METHYL-
SUBMISSION #: 8EHQ-1281-0421 S

CAS NUMBER: 98-51-1   CHEMICAL NAME: TOLUENE, P-TERT-BUTYL-
SUBMISSION #: 8EHQ-1281-0421 S

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 98-73-7 CHEMICAL NAME: BENZOIC ACID, P-TERT-BUTYL-
SUBMISSION #: 8EHQ-0382-0440 S

CAS NUMBER: 98-73-7 CHEMICAL NAME: BENZOIC ACID, 4-(1,1-DIMETHYLETHYL)-
SUBMISSION #: 8EHQ-0382-0440 S

CAS NUMBER: 98-87-3 CHEMICAL NAME: BENZENE, (DICHLOROMETHYL)-
SUBMISSION #: 8EHQ-0582-0444

CAS NUMBER: 98-88-4 CHEMICAL NAME: BENZOYL CHLORIDE
SUBMISSION #: 8EHQ-0980-0360 8EHQ-0582-0444

CAS NUMBER: 100-41-4 CHEMICAL NAME: BENZENE, ETHYL-
SUBMISSION #: 8EHQ-0680-0345 8EHQ-1080-0368

CAS NUMBER: 100-44-7 CHEMICAL NAME: BENZENE, (CHLOROMETHYL)-
SUBMISSION #: 8EHQ-0582-0444

CAS NUMBER: 101-02-0 CHEMICAL NAME: PHOSPHOROUS ACID, TRIPHENYL ESTER
SUBMISSION #: 8EHQ-0682-0451

CAS NUMBER: 102-77-2 CHEMICAL NAME: MORPHOLINE, 4-(2-BENZOTHIAZOLYLTHIO)-
SUBMISSION #: 8EHQ-0280-0334

CAS NUMBER: 102-77-2 CHEMICAL NAME: OBTS
SUBMISSION #: 8EHQ-0280-0334

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 103-69-5   CHEMICAL NAME: BENZENAMINE, N-ETHYL-
SUBMISSION #: 8EHQ-0282-0429   *

CAS NUMBER: 106-42-3   CHEMICAL NAME: BENZENE, 1,4-DIMETHYL-
SUBMISSION #: 8EHQ-1080-0368

CAS NUMBER: 106-99-0   CHEMICAL NAME: 1,3-BUTADIENE
SUBMISSION #: 8EHQ-1080-0370   8EHQ-0382-0441

CAS NUMBER: 107-18-6   CHEMICAL NAME: 2-PROPEN-1-OL
SUBMISSION #: 8EHQ-0181-0381

CAS NUMBER: 108-30-5   CHEMICAL NAME: 2,5-FURANDIONE, DIHYDRO-
SUBMISSION #: 8EHQ-0282-0433   *

CAS NUMBER: 108-38-3   CHEMICAL NAME: BENZENE, 1,3-DIMETHYL-
SUBMISSION #: 8EHQ-1080-0368

CAS NUMBER: 108-88-3   CHEMICAL NAME: BENZENE, METHYL-
SUBMISSION #: 8EHQ-0680-0345   8EHQ-1080-0368

CAS NUMBER: 108-88-3   CHEMICAL NAME: TOLUENE
SUBMISSION #: 8EHQ-0680-0345   8EHQ-1080-0368

CAS NUMBER: 108-90-7   CHEMICAL NAME: BENZENE, CHLORO-
SUBMISSION #: 8EHQ-1080-0368

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 109-86-4 CHEMICAL NAME: ETHANOL, 2-METHOXY-
SUBMISSION #: 8EHQ-0281-0384

CAS NUMBER: 110-26-9 CHEMICAL NAME: 2-PROPENAMIDE, N,N'-METHYLENEBIS-
SUBMISSION #: 8EHQ-0880-0357

CAS NUMBER: 110-80-5 CHEMICAL NAME: ETHANOL, 2-ETHOXY-
SUBMISSION #: 8EHQ-0381-0386

CAS NUMBER: 111-15-9 CHEMICAL NAME: ETHANOL, 2-ETHOXY-, ACETATE
SUBMISSION #: 8EHQ-0682-0450

CAS NUMBER: 111-44-4 CHEMICAL NAME: ETHANE, 1,1'-OXYBIS[2-CHLORO-
SUBMISSION #: 8EHQ-0682-0449 S

CAS NUMBER: 117-81-7 CHEMICAL NAME: 1,2-BENZENEDICARBOXYLIC ACID, BIS(2-ETHYLHEXYL) ESTER
SUBMISSION #: 8EHQ-0982-0457

CAS NUMBER: 118-52-5 CHEMICAL NAME: 2,4-IMIDAZOLIDINEDIONE, 1,3-DICHLORO-5,5-DIMETHYL-
SUBMISSION #: 8EHQ-0281-0382

CAS NUMBER: 121-14-2 CHEMICAL NAME: BENZENE, 1-METHYL-2,4-DINITRO-
SUBMISSION #: 8EHQ-1080-0367

CAS NUMBER: 121-69-7 CHEMICAL NAME: BENZENAMINE, N,N-DIMETHYL-
SUBMISSION #: 8EHQ-0282-0428 *

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 123-91-1 CHEMICAL NAME: 1,4-DIOXANE
SUBMISSION #: 8EHQ-0280-0331 S 8EHQ-0380-0336 S 8EHQ-0682-0449 S

CAS NUMBER: 126-06-7 CHEMICAL NAME: 2,4-IMIDAZOLIDINEDIONE, 3-BROMO-1-CHLORO-5,5-DIMETHYL-
SUBMISSION #: 8EHQ-0281-0382

CAS NUMBER: 127-18-4 CHEMICAL NAME: ETHENE, TETRACHLORO-
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 127-18-4 CHEMICAL NAME: TETRACHLOROETHYLENE
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 129-79-3 CHEMICAL NAME: 9H-FLUOREN-9-ONE, 2,4,7-TRINITRO-
SUBMISSION #: 8EHQ-0480-0339

CAS NUMBER: 129-79-3 CHEMICAL NAME: 2,4,7-TRINITROFLUORENONE
SUBMISSION #: 8EHQ-0480-0339

CAS NUMBER: 140-88-5 CHEMICAL NAME: 2-PROPENOIC ACID, ETHYL ESTER
SUBMISSION #: 8EHQ-1282-0467

CAS NUMBER: 156-60-5 CHEMICAL NAME: ETHENE, 1,2-DICHLORO-, (E)-
SUBMISSION #: 8EHQ-(680-0345 8EHQ-0982-0457

CAS NUMBER: 330-54-1 CHEMICAL NAME: DIURON
SUBMISSION #: 8EHQ-0981-0409

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 330-54-1 CHEMICAL NAME: UREA, N'-(3,4-DICHLOROPHENYL)-N,N-DIMETHYL-
SUBMISSION #: 8EHQ-0981-0409

CAS NUMBER: 330-55-2 CHEMICAL NAME: LINURON
SUBMISSION #: 8EHQ-0981-0409

CAS NUMBER: 330-55-2 CHEMICAL NAME: UREA, N'-(3,4-DICHLOROPHENYL)-N-METHOXY-N-METHYL-
SUBMISSION #: 8EHQ-0981-0409

CAS NUMBER: 619-80-7 CHEMICAL NAME: BENZAMIDE, 4-NITRO-
SUBMISSION #: 8EHQ-1182-0462

CAS NUMBER: 624-83-9 CHEMICAL NAME: METHANE, ISOCYANATO-
SUBMISSION #: 8EHQ-0381-0392

CAS NUMBER: 635-22-3 CHEMICAL NAME: BENZENAMINE, 4-CHLORO-3-NITRO-
SUBMISSION #: 8EHQ-0882-0452

CAS NUMBER: 709-98-8 CHEMICAL NAME: PROPANIL
SUBMISSION #: 8EHQ-0981-0409

CAS NUMBER: 709-98-8 CHEMICAL NAME: PROPIONAMIDE, N-(3,4-DICHLOROPHENYL)-
SUBMISSION #: 8EHQ-0981-0409

CAS NUMBER: 818-61-1 CHEMICAL NAME: 2-PROPENOIC ACID, 2-HYDROXYETHYL ESTER
SUBMISSION #: 8EHQ-0880-0356

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

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CAS NUMBER:  823-40-5                    CHEMICAL NAME: 1,3-BENZENEDIAMINE, 2-METHYL-
        SUBMISSION #: 8EHQ-1030-0367

CAS NUMBER:  868-85-9                    CHEMICAL NAME: PHOSPHONIC ACID, DIMETHYL ESTER
        SUBMISSION #: 8EHQ-1080-0366

CAS NUMBER:  939-97-9                    CHEMICAL NAME: BENZALDEHYDE, P-TERT-BUTYL-
        SUBMISSION #: 8EHQ-1281-0421 S

CAS NUMBER:  939-97-9                    CHEMICAL NAME: BENZALDEHYDE, 4-(1,1-DIMETHYLETHYL)-
        SUBMISSION #: 8EHQ-1281-0421 S

CAS NUMBER:  993-43-1                    CHEMICAL NAME: PHOSPHONOTHIOIC DICHLORIDE, ETHYL-
        SUBMISSION #: 8EHQ-0981-0412

CAS NUMBER:  1072-71-5                   CHEMICAL NAME: 1,3,4-THIADIAZOLIDINE-2,5-DITHIONE
        SUBMISSION #: 8EHQ-0181-0380    *

CAS NUMBER:  1309-64-4                   CHEMICAL NAME: ANTIMONY OXIDE
        SUBMISSION #: 8EHQ-0580-0342

CAS NUMBER:  1313-82-2                   CHEMICAL NAME: SODIUM SULFIDE
        SUBMISSION #: 8EHQ-0282-0435

CAS NUMBER:  1336-36-3                   CHEMICAL NAME: 1,1'-BIPHENYL, CHLORINATED
        SUBMISSION #: 8EHQ-0780-0352                8EHQ-0981-0413          8EHQ-0982-0457
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APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 1336-36-3 CHEMICAL NAME: POLYCHLORINATED BIPHENYLS (PCB)
SUBMISSION #: 8EHQ-0780-0352 8EHQ-0981-0413 8EHQ-0982-0457

CAS NUMBER: 1643-20-5 CHEMICAL NAME: 1-DODECANAMINE, N,N-DIMETHYL-, N-OXIDE
SUBMISSION #: 8EHQ-1280-0376

CAS NUMBER: 1680-21-3 CHEMICAL NAME: 2-PROPENOIC ACID, 1,2-ETHANEDIYLBIS(OXY-2,1-ETHANEDIYL) ESTER
SUBMISSION #: 8EHQ-0981-0410

CAS NUMBER: 1691-99-2 CHEMICAL NAME: 1-OCTANESULFONAMIDE, N-ETHYL-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-HEPTADECAFLUORO-N-(2-HYDROXYETHYL)-
SUBMISSION #: 8EHQ-1180-0373 S

CAS NUMBER: 1746-01-6 CHEMICAL NAME: DIOXIN, 2,3,7,8-TETRACHLORODIBENZO-P-
SUBMISSION #: 8EHQ-0381-0390

CAS NUMBER: 2215-35-2 CHEMICAL NAME: 2-PENTANOL, 4-METHYL-, HYDROGEN PHOSPHORODITHIOATE, ZINC SALT
SUBMISSION #: 8EHQ-0680-0346

CAS NUMBER: 2481-94-9 CHEMICAL NAME: BENZENAMINE, N,N-DIETHYL-4-(PHENYLAZO)-
SUBMISSION #: 8EHQ-0982-0455

CAS NUMBER: 2481-94-9 CHEMICAL NAME: OIL YELLOW E190
SUBMISSION #: 8EHQ-0982-0455

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 2481-94-9 CHEMICAL NAME: C. I. SOLVENT YELLOW 56
SUBMISSION #: 8EHQ-0982-0455

CAS NUMBER: 2487-90-3 CHEMICAL NAME: SILANE, TRIMETHOXY-
SUBMISSION #: 8EHQ-0680-0347

CAS NUMBER: 2524-03-0 CHEMICAL NAME: PHOSPHOROCHLORIDOTHIOIC ACID, O,O-DIMETHYL ESTER
SUBMISSION #: 8EHQ-0381-0387

CAS NUMBER: 2997-92-4 CHEMICAL NAME: PROPANIMIDAMIDE, 2,2'-AZOBIS[2-METHYL-, DIHYDROCHLORIDE
SUBMISSION #: 8EHQ-0282-0427 S

CAS NUMBER: 2997-92-4 CHEMICAL NAME: V-50
SUBMISSION #: 8EHQ-0282-0427 S

CAS NUMBER: 3076-26-4 CHEMICAL NAME: OCTADECANOIC ACID, 2-SULFO-, 1-METHYL ESTER
SUBMISSION #: 8EHQ-0482-0442

CAS NUMBER: 3388-04-3 CHEMICAL NAME: SILANE A-186
SUBMISSION #: 8EHQ-0681-0402

CAS NUMBER: 3388-04-3 CHEMICAL NAME: SILANE, TRIMETHOXY[2-(7-OXABICYCLO[4.1.0]HEPT-3-YL)ETHYL]-
SUBMISSION #: 8EHQ-0681-0402

CAS NUMBER: 3445-11-2 CHEMICAL NAME: 2-PYRROLIDINONE, 1-(2-HYDROXYETHYL)-
SUBMISSION #: 8EHQ-0682-0448 S

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 3524-68-3
CHEMICAL NAME: 2-PROPENOIC ACID, 2-(HYDROXYMETHYL)-2-[[(1-OXO-2-PROPENYL)OXY]METHYL]-1,3-PROPANEDIYL ESTER
SUBMISSION #: 8EHQ-0882-0454

CAS NUMBER: 4680-78-8
CHEMICAL NAME: C. I. ACID GREEN 3
SUBMISSION #: 8EHQ-0780-0350

CAS NUMBER: 4680-78-8
CHEMICAL NAME: BENZENEMETHANAMINIUM, N-ETHYL-N-[4-[[4-[ETHYL[(3-SULFOPHENYL)METHYL]AMINO]PHENYL]PHENYLMETHYLENE]-2,5-CYCLOHEXADIEN-1-YLIDENE]-3-SULFO-, HYDROXIDE, INNER SALT, SODIUM SALT
SUBMISSION #: 8EHQ-0780-0350

CAS NUMBER: 4986-89-4
CHEMICAL NAME: 2-PROPENOIC ACID, 2,2-BIS[[(1-OXO-2-PROPENYL)OXY]METHYL]-1,3-PROPANEDIYL ESTER
SUBMISSION #: 8EHQ-0882-0454

CAS NUMBER: 5026-74-4
CHEMICAL NAME: OXIRANEMETHANAMINE, N-[4-(OXIRANYLMETHOXY)PHENYL]-N-(OXIRANYLMETHYL)-
SUBMISSION #: 8EHQ-1281-0426

CAS NUMBER: 5216-25-1
CHEMICAL NAME: BENZENE, 1-CHLORO-4-(TRICHLOROMETHYL)-
SUBMISSION #: 8EHQ-0980-0360

CAS NUMBER: 6175-45-7
CHEMICAL NAME: ETHANONE, 2,2-DIETHOXY-1-PHENYL-
SUBMISSION #: 8EHQ-0581-0400

CAS NUMBER: 6175-45-7
CHEMICAL NAME: U-2352
SUBMISSION #: 8EHQ-0581-0400

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 6227-14-1 CHEMICAL NAME: C. I. DIRECT VIOLET 9
SUBMISSION #: 8EHQ-0282-0437

CAS NUMBER: 6227-14-1 CHEMICAL NAME: 2-NAPHTHALENESULFONIC ACID, 4-HYDROXY-3-[[2-METHOXY-5-METHYL-4-[(4-SULFOPHENYL)AZO]PHENYL]AZO]-7-(PHENYLAMINO)-, DISODIUM SALT
SUBMISSION #: 8EHQ-0282-0437

CAS NUMBER: 6368-72-5 CHEMICAL NAME: 2-NAPHTHALENAMINE, N-ETHYL-1-[[4-(PHENYLAZO)PHENYL]AZO]-
SUBMISSION #: 8EHQ-0982-0455

CAS NUMBER: 6368-72-5 CHEMICAL NAME: C. I. SOLVENT RED 19
SUBMISSION #: 8EHQ-0982-0455

CAS NUMBER: 7439-92-1 CHEMICAL NAME: LEAD
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 7439-97-6 CHEMICAL NAME: MERCURY
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 7440-02-0 CHEMICAL NAME: NICKEL
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 7440-22-4 CHEMICAL NAME: SILVER
SUBMISSION #: 8EHQ-0680-0345

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CAS NUMBER:  7440-28-0                     CHEMICAL NAME: THALLIUM
          SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER:  7440-36-0                     CHEMICAL NAME: ANTIMONY
          SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER:  7440-38-2                     CHEMICAL NAME: ARSENIC
          SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER:  7440-41-7                     CHEMICAL NAME: BERYLLIUM
          SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER:  7440-43-9                     CHEMICAL NAME: CADMIUM
          SUBMISSION #: 8EHQ-0280-0332
                                                          8EHQ-0680-0345
CAS NUMBER:  7440-47-3                     CHEMICAL NAME: CHROMIUM
          SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER:  7440-50-8                     CHEMICAL NAME: COPPER
          SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER:  7440-66-6                     CHEMICAL NAME: ZINC
          SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER:  7446-09-5                     CHEMICAL NAME: SULFUR DIOXIDE
          SUBMISSION #: 8EHQ-0181-0378
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APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

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CAS NUMBER:  7705-08-0                    CHEMICAL NAME: IRON CHLORIDE
          SUBMISSION #: 8EHQ-0880-0358    *

CAS NUMBER:  7782-49-2                    CHEMICAL NAME: SELENIUM
          SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER:  7782-50-5                    CHEMICAL NAME: CHLORINE
          SUBMISSION #: 8EHQ-1182-0466    *

CAS NUMBER:  7783-06-4                    CHEMICAL NAME: HYDROGEN SULFIDE
          SUBMISSION #: 8EHQ-0580-0343

CAS NUMBER:  7789-21-1                    CHEMICAL NAME: FLUOROSULFURIC ACID
          SUBMISSION #: 8EHQ-0881-0407

CAS NUMBER:  8004-87-3                    CHEMICAL NAME: C. I. BASIC VIOLET 1
          SUBMISSION #: 8EHQ-0282-0436    *

CAS NUMBER:  8006-61-9                    CHEMICAL NAME: GASOLINE, NATURAL
          SUBMISSION #: 8EHQ-1281-0422

CAS NUMBER:  8006-61-9                    CHEMICAL NAME: GASOLINE, UNLEADED
          SUBMISSION #: 8EHQ-1281-0422

CAS NUMBER:  9003-01-4                    CHEMICAL NAME: POLYACRYLIC ACID
          SUBMISSION #: 8EHQ-0382-0438 S
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APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 9003-01-4 CHEMICAL NAME: 2-PROPENOIC ACID, HOMOPOLYMER
SUBMISSION #: 8EHQ-0382-0438 S

CAS NUMBER: 10199-89-0 CHEMICAL NAME: BENZOFURAZAN, 4-CHLORO-7-NITRO-
SUBMISSION #: 8EHQ-0281-0383 S *

CAS NUMBER: 10310-38-0 CHEMICAL NAME: CYAGARD RF-1
SUBMISSION #: 8EHQ-0780-0369

CAS NUMBER: 10310-38-0 CHEMICAL NAME: PHOSPHONIUM, 1,2-ETHANEDIYLBIS[TRIS(2-CYANOETHYL)-, DIBROMIDE
SUBMISSION #: 8EHQ-0780-0369

CAS NUMBER: 10533-67-2 CHEMICAL NAME: ACETALDEHYDE, (METHYLTHIO)-, OXIME
SUBMISSION #: 8EHQ-0880-0355

CAS NUMBER: 10588-01-9 CHEMICAL NAME: CHROMIC ACID, DISODIUM SALT
SUBMISSION #: 8EHQ-1182-0463

CAS NUMBER: 12002-48-1 CHEMICAL NAME: BENZENE, TRICHLORO-
SUBMISSION #: 8EHQ-0932-0457

CAS NUMBER: 13292-87-0 CHEMICAL NAME: BORANE, COMPD. WITH THIOBIS[METHANE] (1:1)
SUBMISSION #: 8EHQ-1180-0372

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 13674-87-8   CHEMICAL NAME: FYROL FR-2
SUBMISSION #: 8EHQ-1280-0401 S

CAS NUMBER: 13674-87-8   CHEMICAL NAME: 2-PROPANOL, 1,3-DICHLORO-, PHOSPHATE (3:1)
SUBMISSION #: 8EHQ-1280-0401 S

CAS NUMBER: 13752-51-7   CHEMICAL NAME: CURE-RITE 18
SUBMISSION #: 8EHQ-0280-0334

CAS NUMBER: 13752-51-7   CHEMICAL NAME: MORPHOLINE, 4-[(4-MORPHOLINYLTHIO)THIOXOMETHYL]-
SUBMISSION #: 8EHQ-0280-0334

CAS NUMBER: 13765-19-0   CHEMICAL NAME: CHROMIC ACID, CALCIUM SALT (1:1)
SUBMISSION #: 8EHQ-1182-0463

CAS NUMBER: 14047-09-7   CHEMICAL NAME: BENZENE, 3,3',4,4'-TETRACHLOROAZO-
SUBMISSION #: 8EHQ-0981-0409   8EHQ-1281-0424

CAS NUMBER: 14285-59-7   CHEMICAL NAME: COBALTATE(4-), [29H,31H-PHTHALOCYANINE-2,9,16,23-TETRASULFONATO(6-)-N29,N30,N31,N32]-, TETRAHYDROGEN, (SP-4-1)-
SUBMISSION #: 8EHQ-0980-0361 S

CAS NUMBER: 14808-60-7   CHEMICAL NAME: QUARTZ
SUBMISSION #: 8EHQ-0780-0354

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 15022-08-9
SUBMISSION #: 8EHQ-0181-0381
CHEMICAL NAME: CARBONIC ACID, DI-2-PROPENYL ESTER

CAS NUMBER: 15336-81-9
SUBMISSION #: 8EHQ-0481-0397
CHEMICAL NAME: 2,4-IMIDAZOLIDINEDIONE, 5,5-DIMETHYL-1,3-BIS(OXIRANYLMETHYL)-

CAS NUMBER: 15336-82-0
SUBMISSION #: 8EHQ-1081-0418
CHEMICAL NAME: 2,4-IMIDAZOLIDINEDIONE, 5-ETHYL-5-METHYL-1,3-BIS(OXIRANYLMETHYL)-

CAS NUMBER: 15336-82-0
SUBMISSION #: 8EHQ-1081-0418
CHEMICAL NAME: XU-238

CAS NUMBER: 17557-23-2
SUBMISSION #: 8EHQ-0481-0397
CHEMICAL NAME: OXIRANE, 2,2'-[(2,2-DIMETHYL-1,3-PROPANEDIYL)BIS(OXYMETHYLENE)]BIS-

CAS NUMBER: 17831-71-9
SUBMISSION #: 8EHQ-0981-0411
CHEMICAL NAME: 2-PROPENOIC ACID, OXYBIS(2,1-ETHANEDIYLOXY-2,1-ETHANEDIYL) ESTER

CAS NUMBER: 20354-26-1
SUBMISSION #: 8EHQ-0981-0409
CHEMICAL NAME: METHAZOLE (TECHNICAL)

CAS NUMBER: 20354-26-1
SUBMISSION #: 8EHQ-0981-0409
CHEMICAL NAME: 1,2,4-OXADIAZOLIDINE-3,5-DIONE,

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 21232-47-3 CHEMICAL NAME: BENZENE, 3,3',4,4'-TETRACHLOROAZOXY-

SUBMISSION #: 8EHQ-0981-0409 8EHQ-1281-0424

CAS NUMBER: 21850-44-2 CHEMICAL NAME: BENZENE, 1,1'-(1-METHYLETHYLIDENE)BIS[3,5-DIBROMO-4-(2,3-DIBROMOPROPOXY)-

SUBMISSION #: 8EHQ-0982-0458

CAS NUMBER: 25038-04-4 CHEMICAL NAME: 1,2,3-PROPANETRIOL, POLYMER WITH (CHLOROMETHYL)OXIRANE

SUBMISSION #: 8EHQ-0781-0406 S

CAS NUMBER: 25134-21-8 CHEMICAL NAME: 4,7-METHANOISOBENZOFURAN-1,3-DIONE, 3A,4,7,7A-TETRAHYDROMETHYL-

SUBMISSION #: 8EHQ-0282-0431 *

CAS NUMBER: 25134-21-8 CHEMICAL NAME: NADIC METHYL ANHYDRIDE

SUBMISSION #: 8EHQ-0282-0431 *

CAS NUMBER: 25167-82-2 CHEMICAL NAME: PHENOL, TRICHLORO-

SUBMISSION #: 8EHQ-0381-0390

CAS NUMBER: 25321-14-6 CHEMICAL NAME: BENZENE, METHYLDINITRO-

SUBMISSION #: 8EHQ-1080-0367

CAS NUMBER: 25376-45-8 CHEMICAL NAME: BENZENEDIAMINE, AR-METHYL-

SUBMISSION #: 8EHQ-1080-0367

CAS NUMBER: 25377-73-5
SUBMISSION #: 8EHQ-0282-0432
CHEMICAL NAME: 2,5-FURANDIONE, 3-(DODECENYL)DIHYDRO-
*

CAS NUMBER: 26472-00-4
SUBMISSION #: 8EHQ-1081-0419
CHEMICAL NAME: 4,7-METHANO-1H-INDENE, 3A,4,7,7A-TETRAHYDRODIMETHYL-

CAS NUMBER: 26472-00-4
SUBMISSION #: 8EHQ-1081-0419
CHEMICAL NAME: METHYLCYCLOPENTADIENE DIMER

CAS NUMBER: 28768-32-3
SUBMISSION #: 8EHQ-0480-0338
CHEMICAL NAME: MY 720

CAS NUMBER: 28768-32-3
SUBMISSION #: 8EHQ-0480-0338
CHEMICAL NAME: OXIRANEMETHANAMINE, N,N'-(METHYLENEDI-4,1-PHENYLENE)BIS[N-(OXIRANYLMETHYL)-

CAS NUMBER: 29383-29-7
SUBMISSION #: 8EHQ-0980-0361 S
8EHQ-0681-0403 S
CHEMICAL NAME: COBALTATE(2-), [29H,31H-PHTHALOCYANINEDISULFONATO(4-)-N29,N30,N31,N32]-, DIHYDROGEN

CAS NUMBER: 29454-23-7
SUBMISSION #: 8EHQ-0482-0442
CHEMICAL NAME: TETRADECANOIC ACID, 2-SULFO-, 1-METHYL ESTER

CAS NUMBER: 30638-08-5
SUBMISSION #: 8EHQ-0681-0403 S
CHEMICAL NAME: COBALTATE(1-), [29H,31H-PHTHALOCYANINESULFONATO(3-)-N29,N30,N31,N32]-, HYDROGEN

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 30947-30-9   CHEMICAL NAME: IRGASTAB 2002
SUBMISSION #: 8EHQ-0482-0443

CAS NUMBER: 30947-30-9   CHEMICAL NAME: PHOSPHONIC ACID, [[3,5-BIS(1,1-DIMETHYLETHYL)-4-HYDROXYPHENYL]METHYL]-, MONOETHYL ESTER, NICKEL(2+) SALT (2:1)
SUBMISSION #: 8EHQ-0482-0443

CAS NUMBER: 53417-29-1   CHEMICAL NAME: PENTAERYTHRITOL DIACRYLATE
SUBMISSION #: 8EHQ-0882-0454

CAS NUMBER: 57138-85-9   CHEMICAL NAME: BENZENAMINE, POLYMER WITH FORMALDEHYDE, HYDROCHLORIDE
SUBMISSION #: 8EHQ-0980-0362

CAS NUMBER: 57472-68-1   CHEMICAL NAME: 2-PROPENOIC ACID, OXYBIS(METHYL-2,1-ETHANEDIYL) ESTER
SUBMISSION #: 8EHQ-1082-0459

CAS NUMBER: 58849-75-5   CHEMICAL NAME: HEXADECANOIC ACID, 2-SULFO-, 1-METHYL ESTER
SUBMISSION #: 8EHQ-0482-0442

CAS NUMBER: 61789-87-5   CHEMICAL NAME: SULFONIC ACIDS, PETROLEUM, MAGNESIUM SALTS
SUBMISSION #: 8EHQ-1081-0414

CAS NUMBER: 63231-67-4   CHEMICAL NAME: SILICA GEL
SUBMISSION #: 8EHQ-0780-0354

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 64741-46-4 CHEMICAL NAME: NAPHTHA (PETROLEUM), LIGHT STRAIGHT-RUN
SUBMISSION #: 8EHQ-0682-0446 S

CAS NUMBER: 64741-52-2 CHEMICAL NAME: DISTILLATES (PETROLEUM), LIGHT NAPHTHENIC
SUBMISSION #: 8EHQ-0682-0447

CAS NUMBER: 64741-55-5 CHEMICAL NAME: NAPHTHA (PETROLEUM), LIGHT CATALYTIC CRACKED
SUBMISSION #: 8EHQ-0682-0446 S

CAS NUMBER: 64741-64-6 CHEMICAL NAME: NAPHTHA (PETROLEUM), FULL-RANGE ALKYLATE
SUBMISSION #: 8EHQ-0682-0446 S

CAS NUMBER: 64741-67-9 CHEMICAL NAME: KERMAC 218A
SUBMISSION #: 8EHQ-0280-0333

CAS NUMBER: 64741-67-9 CHEMICAL NAME: RESIDUES (PETROLEUM), CATALYTIC REFORMER FRACTIONATOR
SUBMISSION #: 8EHQ-0280-0333

CAS NUMBER: 64742-04-7 CHEMICAL NAME: EXTRACTS (PETROLEUM), HEAVY PARAFFINIC DISTILLATE SOLVENT
SUBMISSION #: 8EHQ-0281-0385

CAS NUMBER: 64742-04-7 CHEMICAL NAME: GULF N.E. 75 (PROCESS 63)
SUBMISSION #: 8EHQ-0281-0385

CAS NUMBER: 64742-11-6 CHEMICAL NAME: EXTRACTS (PETROLEUM), HEAVY NAPHTHENIC DISTILLATE SOLVENT
SUBMISSION #: 8EHQ-0281-0385

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 64742-11-6 CHEMICAL NAME: GULF N.E. 61 (PROCESS 65)
SUBMISSION #: 8EHQ-0281-0385

CAS NUMBER: 64742-16-1 CHEMICAL NAME: PETROLEUM RESINS
SUBMISSION #: 8EHQ-0281-0385

CAS NUMBER: 64742-46-7 CHEMICAL NAME: DISTILLATES (PETROLEUM), HYDROTREATED MIDDLE
SUBMISSION #: 8EHQ-0280-0333

CAS NUMBER: 64742-46-7 CHEMICAL NAME: KERMAC 600W
SUBMISSION #: 8EHQ-0280-0333

CAS NUMBER: 64742-52-5 CHEMICAL NAME: DISTILLATES (PETROLEUM), HYDROTREATED HEAVY NAPHTHENIC
SUBMISSION #: 8EHQ-0281-0385

CAS NUMBER: 64742-52-5 CHEMICAL NAME: GULF 100 TEXAS OIL
SUBMISSION #: 8EHQ-0281-0385

CAS NUMBER: 64742-55-8 CHEMICAL NAME: DISTILLATES (PETROLEUM), HYDROTREATED LIGHT PARAFFINIC
SUBMISSION #: 8EHQ-0281-0385 8EHQ-0681-0404

CAS NUMBER: 64742-55-8 CHEMICAL NAME: GULF PARALUX 70
SUBMISSION #: 8EHQ-0681-0404

CAS NUMBER: 67762-92-9 CHEMICAL NAME: SILICONE Y-6607
SUBMISSION #: 8EHQ-0680-0349

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 67762-92-9
CHEMICAL NAME: SILOXANES AND SILICONES, DI-ME, DIMETHYLAMINO-TERMINATED
SUBMISSION #: 8EHQ-0680-0349

CAS NUMBER: 68153-35-5
CHEMICAL NAME: ETHANAMINIUM, 2-AMINO-N-(2-AMINOETHYL)-N-(2-HYDROXYETHYL)-N-METHYL-, N,N'-DITALLOW ACYL DERIVS., ME SULFATES (SALTS)
SUBMISSION #: 8EHQ-1180-0371

CAS NUMBER: 68187-58-6
CHEMICAL NAME: PITCH, PETROLEUM, CONDENSED-RING AROM.
SUBMISSION #: 8EHQ-0780-0353

CAS NUMBER: 68308-34-9
CHEMICAL NAME: SHALE OILS
SUBMISSION #: 8EHQ-1081-0417

CAS NUMBER: 68410-08-2
CHEMICAL NAME: DISTILLATES (COAL), SOLVENT-REFINING (SRC), RECYCLE
SUBMISSION #: 8EHQ-0980-0363

CAS NUMBER: 68441-14-5
CHEMICAL NAME: BROMOBUTYL 2244
SUBMISSION #: 8EHQ-1281-0420

CAS NUMBER: 68441-14-5
CHEMICAL NAME: 1,3-BUTADIENE, 2-METHYL-, POLYMER WITH 2-METHYL-1-PROPENE, BROMINATED
SUBMISSION #: 8EHQ-1281-0420

CAS NUMBER: 68441-14-5
CHEMICAL NAME: RUBBER, BROMINATED BUTYL-
SUBMISSION #: 8EHQ-1281-0420

APPENDIX B: STATUS REPORTS BY CAS NUMBER (CONT.)

CAS NUMBER: 68442-22-8 CHEMICAL NAME: PHOSPHORODITHIOIC ACID, MIXED 2-ETHYLHEXYL AND 2-METHYLPROPYL ESTERS, ZINC SALTS

SUBMISSION #: 8EHQ-0680-0346

CAS NUMBER: 68479-77-6 CHEMICAL NAME: BL-4420

SUBMISSION #: 8EHQ-0381-0391

CAS NUMBER: 68479-77-6 CHEMICAL NAME: PROPANOIC ACID, 2,3-DIBROMO-, 2-HYDROXYETHYL ESTER

SUBMISSION #: 8EHQ-0381-0391

CAS NUMBER: 68555-73-7 CHEMICAL NAME: 1-HEPTANESULFONAMIDE, N-ETHYL-1,1,2,2,3,3,4,4,5,5,6,6,7,7,7-PENTADECAFLUORO-N-(2-HYDROXYETHYL)-

SUBMISSION #: 8EHQ-1180-0373 S

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* Based on a preliminary evaluation, EPA believes that the submitted information did not warrant reporting pursuant to Section 8(e) of TSCA. In some cases, a submitting company was requested to provide the basis for its contention that the reported information offered reasonable support for a conclusion of substantial risk of injury to health and/or the environment as defined in EPA's March 16, 1978, TSCA Section 8(e) policy statement (Appendix A of this volume).

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME

CAS NUMBER: 10533-67-2 CHEMICAL NAME: ACETALDEHYDE, (METHYLTHIO)-, OXIME
SUBMISSION #: 8EHQ-0880-0355

CAS NUMBER: 4680-78-8 CHEMICAL NAME: C. I. ACID GREEN 3
SUBMISSION #: 8EHQ-0780-0350

CAS NUMBER: UNKNOWN CHEMICAL NAME: ACRYLIC ACID-STARCH GRAFT, PARTIAL SODIUM SALT
SUBMISSION #: 8EHQ-0382-0438 S

CAS NUMBER: 7440-36-0 CHEMICAL NAME: ANTIMONY
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 1309-64-4 CHEMICAL NAME: ANTIMONY OXIDE
SUBMISSION #: 8EHQ-0580-0342

CAS NUMBER: 7440-38-2 CHEMICAL NAME: ARSENIC
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 8004-87-3 CHEMICAL NAME: C. I. BASIC VIOLET 1
SUBMISSION #: 8EHQ-0282-0436 *

CAS NUMBER: 81-88-9 CHEMICAL NAME: C. I. BASIC VIOLET 10
SUBMISSION #: 8EHQ-0282-0434

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

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CAS NUMBER:  939-97-9                          CHEMICAL NAME: BENZALDEHYDE, P-TERT-BUTYL-
          SUBMISSION #: 8EHQ-1281-0421 S

CAS NUMBER:  939-97-9                          CHEMICAL NAME: BENZALDEHYDE, 4-(1,1-DIMETHYLETHYL)-
          SUBMISSION #: 8EHQ-1281-0421 S

CAS NUMBER:  619-80-7                          CHEMICAL NAME: BENZAMIDE, 4-NITRO-
          SUBMISSION #: 8EHQ-1182-0462

CAS NUMBER:  103-69-5                          CHEMICAL NAME: BENZENAMINE, N-ETHYL-
          SUBMISSION #: 8EHQ-0282-0429          *

CAS NUMBER:  91-66-7                           CHEMICAL NAME: BENZENAMINE, N,N-DIETHYL-
          SUBMISSION #: 8EHQ-0282-0430          *

CAS NUMBER:  2481-94-9                         CHEMICAL NAME: BENZENAMINE, N,N-DIETHYL-4-(PHENYLAZO)-
          SUBMISSION #: 8EHQ-0982-0455

CAS NUMBER:  121-69-7                          CHEMICAL NAME: BENZENAMINE, N,N-DIMETHYL-
          SUBMISSION #: 8EHQ-0282-0428          *

CAS NUMBER:  57138-85-9                        CHEMICAL NAME: BENZENAMINE, POLYMER WITH FORMALDEHYDE, HYDROCHLORIDE
          SUBMISSION #: 8EHQ-0980-0362

CAS NUMBER:  95-53-4                           CHEMICAL NAME: BENZENAMINE, 2-METHYL-
          SUBMISSION #: 8EHQ-0680-0348
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CAS NUMBER: 95-76-1 CHEMICAL NAME: BENZENAMINE, 3,4-DICHLORO-
SUBMISSION #: 8EHQ-0981-0409

CAS NUMBER: 635-22-3 CHEMICAL NAME: BENZENAMINE, 4-CHLORO-3-NITRO-
SUBMISSION #: 8EHQ-0882-0452

CAS NUMBER: 80-08-0 CHEMICAL NAME: BENZENAMINE, 4,4'-SULFONYLBIS-
SUBMISSION #: 8EHQ-0480-0338

CAS NUMBER: 71-43-2 CHEMICAL NAME: BENZENE
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 108-90-7 CHEMICAL NAME: BENZENE, CHLORO-
SUBMISSION #: 8EHQ-1080-0368

CAS NUMBER: 100-44-7 CHEMICAL NAME: BENZENE, (CHLOROMETHYL)-
SUBMISSION #: 8EHQ-0582-0444

CAS NUMBER: 25376-45-8 CHEMICAL NAME: BENZENEDIAMINE, AR-METHYL-
SUBMISSION #: 8EHQ-1080-0367

CAS NUMBER: UNKNOWN CHEMICAL NAME: BENZENEDIAMINE(S), CHLORINATED, AR-METHYL-
SUBMISSION #: 8EHQ-1082-0461

CAS NUMBER: 823-40-5 CHEMICAL NAME: 1,3-BENZENEDIAMINE, 2-METHYL-
SUBMISSION #: 8EHQ-1080-0367

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 95-80-7 CHEMICAL NAME: 1,3-BENZENEDIAMINE, 4-METHYL-
SUBMISSION #: 8EHQ-1080-0367

CAS NUMBER: 117-81-7 CHEMICAL NAME: 1,2-BENZENEDICARBOXYLIC ACID, BIS(2-ETHYLHEXYL) ESTER
SUBMISSION #: 8EHQ-0982-0457

CAS NUMBER: UNKNOWN CHEMICAL NAME: 1,2-BENZENEDICARBOXYLIC ACID, 3,4,5,6-TETRABROMO-, DI-2-PROPENYL ESTER
SUBMISSION #: 8EHQ-0980-0359

CAS NUMBER: 98-87-3 CHEMICAL NAME: BENZENE, (DICHLOROMETHYL)-
SUBMISSION #: 8EHQ-0582-0444

CAS NUMBER: 100-41-4 CHEMICAL NAME: BENZENE, ETHYL-
SUBMISSION #: 8EHQ-0680-0345
8EHQ-1080-0368

CAS NUMBER: 4680-78-8 CHEMICAL NAME: BENZENEMETHANAMINIUM, N-ETHYL-N-[4-[[4-[ETHYL[(3-SULFOPHENYL)METHYL]AMINO]PHENYL]PHENYLMETHYLENE]-2,5-CYCLOHEXADIEN-1-YLIDENE]-3-SULFO-, HYDROXIDE, INNER SALT, SODIUM SALT
SUBMISSION #: 8EHQ-0780-0350

CAS NUMBER: 108-88-3 CHEMICAL NAME: BENZENE, METHYL-
SUBMISSION #: 8EHQ-0680-0345
8EHQ-1080-0368

CAS NUMBER: 25321-14-6 CHEMICAL NAME: BENZENE, METHYLDINITRO-
SUBMISSION #: 8EHQ-1080-0367

CAS NUMBER: 12002-48-1 CHEMICAL NAME: BENZENE, TRICHLORO-
SUBMISSION #: 8EHQ-0982-0457

CAS NUMBER: 98-07-7 CHEMICAL NAME: BENZENE, (TRICHLOROMETHYL)-
SUBMISSION #: 8EHQ-0980-0360
8EHQ-0582-0444

CAS NUMBER: 5216-25-1 CHEMICAL NAME: BENZENE, 1-CHLORO-4-(TRICHLOROMETHYL)-
SUBMISSION #: 8EHQ-0980-0360

CAS NUMBER: 121-14-2 CHEMICAL NAME: BENZENE, 1-METHYL-2,4-DINITRO-
SUBMISSION #: 8EHQ-1080-0367

CAS NUMBER: 98-51-1 CHEMICAL NAME: BENZENE, 1-(1,1-DIMETHYLETHYL)-4-METHYL-
SUBMISSION #: 8EHQ-1281-0421 S

CAS NUMBER: 21850-44-2 CHEMICAL NAME: BENZENE, 1,1'-(1-METHYLETHYLIDENE)BIS[3,5-DIBROMO-4-(2,3-DIBROMOPROPOXY)-
SUBMISSION #: 8EHQ-0982-0458

CAS NUMBER: 95-50-1 CHEMICAL NAME: BENZENE, 1,2-DICHLORO-
SUBMISSION #: 8EHQ-1080-0368

CAS NUMBER: 108-38-3 CHEMICAL NAME: BENZENE, 1,3-DIMETHYL-
SUBMISSION #: 8EHQ-1080-0368

CAS NUMBER: 106-42-3
CHEMICAL NAME: BENZENE, 1,4-DIMETHYL-
SUBMISSION #: 8EHQ-1080-0368

CAS NUMBER: 14047-09-7
CHEMICAL NAME: BENZENE, 3,3',4,4'-TETRACHLOROAZO-
SUBMISSION #: 8EHQ-0981-0409
8EHQ-1281-0424

CAS NUMBER: 21232-47-3
CHEMICAL NAME: BENZENE, 3,3',4,4'-TETRACHLOROAZOXY-
SUBMISSION #: 8EHQ-0981-0409
8EHQ-1281-0424

CAS NUMBER: NONE
CHEMICAL NAME: BENZOFURAZANS, NITRO-
SUBMISSION #: 8EHQ-0281-0383 S *

CAS NUMBER: 10199-89-0
CHEMICAL NAME: BENZOFURAZAN, 4-CHLORO-7-NITRO-
SUBMISSION #: 8EHQ-0281-0383 S *

CAS NUMBER: NONE
CHEMICAL NAME: BENZOFUROXANS, NITRO-
SUBMISSION #: 8EHQ-0281-0383 S *

CAS NUMBER: 98-73-7
CHEMICAL NAME: BENZOIC ACID, P-TERT-BUTYL-
SUBMISSION #: 8EHQ-0382-0440 S

CAS NUMBER: 98-73-7
CHEMICAL NAME: BENZOIC ACID, 4-(1,1-DIMETHYLETHYL)-
SUBMISSION #: 8EHQ-0382-0440 S

CAS NUMBER: 98-88-4
CHEMICAL NAME: BENZOYL CHLORIDE
SUBMISSION #: 8EHQ-0980-0360
8EHQ-0582-0444

CAS NUMBER: 7440-41-7 CHEMICAL NAME: BERYLLIUM
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 1336-36-3 CHEMICAL NAME: 1,1'-BIPHENYL, CHLORINATED
SUBMISSION #: 8EHQ-0780-0352 8EHQ-0981-0413 8EHQ-0982-0457

CAS NUMBER: UNKNOWN CHEMICAL NAME: 1,1'-BIPHENYL, 2,2',4,4'-TETRACHLORO-
SUBMISSION #: 8EHQ-0981-0413

CAS NUMBER: 68479-77-6 CHEMICAL NAME: BL-4420
SUBMISSION #: 8EHQ-0381-0391

CAS NUMBER: 13292-87-0 CHEMICAL NAME: BORANE, COMPD. WITH THIOBIS[METHANE] (1:1)
SUBMISSION #: 8EHQ-1180-0372

CAS NUMBER: 68441-14-5 CHEMICAL NAME: BROMOBUTYL 2244
SUBMISSION #: 8EHQ-1281-0420

CAS NUMBER: 106-99-0 CHEMICAL NAME: 1,3-BUTADIENE
SUBMISSION #: 8EHQ-1080-0370 8EHQ-0382-0441

CAS NUMBER: 68441-14-5 CHEMICAL NAME: 1,3-BUTADIENE, 2-METHYL-, POLYMER WITH 2-METHYL-1-PROPENE, BROMINATED
SUBMISSION #: 8EHQ-1281-0420

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 7440-43-9 CHEMICAL NAME: CADMIUM
SUBMISSION #: 8EHQ-0280-0332
8EHQ-0680-0345

CAS NUMBER: UNKNOWN CHEMICAL NAME: CADMIUM SALTS OF P-TERT-BUTYL BENZOIC ACID AND BENZOIC ACID
SUBMISSION #: 8EHQ-1180-0375 S

CAS NUMBER: NONE CHEMICAL NAME: CALCO OIL BRONZE Y
SUBMISSION #: 8EHQ-1182-0465

CAS NUMBER: NONE CHEMICAL NAME: CALCO OIL RED YM
SUBMISSION #: 8EHQ-1182-0465

CAS NUMBER: 86-28-2 CHEMICAL NAME: 9H-CARBAZOLE, 9-ETHYL-
SUBMISSION #: 8EHQ-1080-0368

CAS NUMBER: UNKNOWN CHEMICAL NAME: CARBON (FIBERS)
SUBMISSION #: 8EHQ-1281-0423

CAS NUMBER: 15022-08-9 CHEMICAL NAME: CARBONIC ACID, DI-2-PROPENYL ESTER
SUBMISSION #: 8EHQ-0181-0381

CAS NUMBER: UNKNOWN CHEMICAL NAME: CHIMASSORB 944
SUBMISSION #: 8EHQ-0480-0340

CAS NUMBER: 7782-50-5 CHEMICAL NAME: CHLORINE
SUBMISSION #: 8EHQ-1182-0466 *

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 13765-19-0 CHEMICAL NAME: CHROMIC ACID, CALCIUM SALT (1:1)
SUBMISSION #: 8EHQ-1182-0463

CAS NUMBER: 10588-01-9 CHEMICAL NAME: CHROMIC ACID, DISODIUM SALT
SUBMISSION #: 8EHQ-1182-0463

CAS NUMBER: 7440-47-3 CHEMICAL NAME: CHROMIUM
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: NONE CHEMICAL NAME: COAL, SOLVENT-REFINING (SRC) PROCESS/PRODUCTS
SUBMISSION #: 8EHQ-0980-0363
8EHQ-0581-0398

CAS NUMBER: 30638-08-5 CHEMICAL NAME: COBALTATE(1-), [29H,31H-PHTHALOCYANINESULFONATO(3-)-N29,N30,N31,N32]-, HYDROGEN
SUBMISSION #: 8EHQ-0681-0403 S

CAS NUMBER: 29383-29-7 CHEMICAL NAME: COBALTATE(2-), [29H,31H-PHTHALOCYANINEDISULFONATO(4-)-N29,N30,N31,N32]-, DIHYDROGEN
SUBMISSION #: 8EHQ-0980-0361 S
8EHQ-0681-0403 S

CAS NUMBER: 14285-59-7 CHEMICAL NAME: COBALTATE(4-), [29H,31H-PHTHALOCYANINE-2,9,16,23-TETRASULFONATO(6-)-N29,N30,N31,N32]-, TETRAHYDROGEN, (SP-4-1)-
SUBMISSION #: 8EHQ-0980-0361 S

CAS NUMBER: 7440-50-8 CHEMICAL NAME: COPPER
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 13752-51-7 CHEMICAL NAME: CURE-RITE 18
SUBMISSION #: 8EHQ-0280-0334

CAS NUMBER: NONE CHEMICAL NAME: CUTTING FLUID
SUBMISSION #: 8EHQ-0380-0335 S

CAS NUMBER: 10310-38-0 CHEMICAL NAME: CYAGARD RF-1
SUBMISSION #: 8EHQ-0780-0369

CAS NUMBER: NONE CHEMICAL NAME: CYCLOHEXANES, HEXAHALOGENATED-
SUBMISSION #: 8EHQ-0331-0393

CAS NUMBER: 87-84-3 CHEMICAL NAME: CYCLOHEXANE, 1,2,3,4,5-PENTABROMO-6-CHLORO-
SUBMISSION #: 8EHQ-0381-0393

CAS NUMBER: 80-08-0 CHEMICAL NAME: DDS
SUBMISSION #: 8EHQ-0480-0338

CAS NUMBER: UNKNOWN CHEMICAL NAME: V-50 DECOMPOSITION PRODUCT
SUBMISSION #: 8EHQ-0282-0427 S

CAS NUMBER: NONE CHEMICAL NAME: DIBENZOFURANS, CHLORINATED
SUBMISSION #: 8EHQ-0981-0409

CAS NUMBER: 77-73-6 CHEMICAL NAME: DICYCLOPENTADIENE
SUBMISSION #: 8EHQ-0980-0364

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 123-91-1 CHEMICAL NAME: 1,4-DIOXANE
SUBMISSION #: 8EHQ-0280-0331 S 8EHQ-0380-0336 S 8EHQ-0682-0449 S

CAS NUMBER: NONE CHEMICAL NAME: DIOXINS, CHLORINATED
SUBMISSION #: 8EHQ-0381-0390 8EHQ-0981-0409

CAS NUMBER: 1746-01-6 CHEMICAL NAME: DIOXIN, 2,3,7,8-TETRACHLORODIBENZO-P-
SUBMISSION #: 8EHQ-0381-0390

CAS NUMBER: 6227-14-1 CHEMICAL NAME: C. I. DIRECT VIOLET 9
SUBMISSION #: 8EHQ-0282-0437

CAS NUMBER: UNKNOWN CHEMICAL NAME: DISPERSE BLUE 291
SUBMISSION #: 8EHQ-0481-0396 *

CAS NUMBER: UNKNOWN CHEMICAL NAME: DISTILLATES (COAL), SOLVENT-REFINING (SRC), MIDDLE
SUBMISSION #: 8EHQ-0581-0398

CAS NUMBER: 68410-08-2 CHEMICAL NAME: DISTILLATES (COAL), SOLVENT-REFINING (SRC), RECYCLE
SUBMISSION #: 8EHQ-0980-0363

CAS NUMBER: 64742-52-5 CHEMICAL NAME: DISTILLATES (PETROLEUM), HYDROTREATED HEAVY NAPHTHENIC
SUBMISSION #: 8EHQ-0281-0385

CAS NUMBER: 64742-55-8 CHEMICAL NAME: DISTILLATES (PETROLEUM), HYDROTREATED LIGHT PARAFFINIC
SUBMISSION #: 8EHQ-0281-0385 8EHQ-0681-0404

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 64742-46-7
SUBMISSION #: 8EHQ-0280-0333
CHEMICAL NAME: DISTILLATES (PETROLEUM), HYDROTREATED MIDDLE

CAS NUMBER: 64741-52-2
SUBMISSION #: 8EHQ-0682-0447
CHEMICAL NAME: DISTILLATES (PETROLEUM), LIGHT NAPHTHENIC

CAS NUMBER: 330-54-1
SUBMISSION #: 8EHQ-0981-0409
CHEMICAL NAME: DIURON

CAS NUMBER: UNKNOWN
SUBMISSION #: 8EHQ-1280-0376
CHEMICAL NAME: DODECANAMINE, N-METHYL-N-NITROSO-

CAS NUMBER: 1643-20-5
SUBMISSION #: 8EHQ-1280-0376
CHEMICAL NAME: 1-DODECANAMINE, N,N-DIMETHYL-, N-OXIDE

CAS NUMBER: UNKNOWN
SUBMISSION #: 8EHQ-0481-0396 *
CHEMICAL NAME: EASTMAN BLUE RBS

CAS NUMBER: 80-08-0
SUBMISSION #: 8EHQ-0480-0338
CHEMICAL NAME: EPORAL

CAS NUMBER: NONE
SUBMISSION #: 8EHQ-0481-0397
CHEMICAL NAME: EPOXY RESINS

CAS NUMBER: 81-88-9
SUBMISSION #: 8EHQ-0282-0434
CHEMICAL NAME: ETHANAMINIUM, N-[9-(2-CARBOXYPHENYL)-6-(DIETHYLAMINO)-3H-XANTHEN-3-YLIDENE]-N-ETHYL-, CHLORIDE

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 68153-35-5 CHEMICAL NAME: ETHANAMINIUM, 2-AMINO-N-(2-AMINOETHYL)-N-(2-HYDROXYETHYL)-N-METHYL-, N,N'-DITALLOW ACYL DERIVS., ME SULFATES (SALTS)
SUBMISSION #: 8EHQ-1180-0371

CAS NUMBER: 75-34-3 CHEMICAL NAME: ETHANE, 1,1-DICHLORO-
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 71-55-6 CHEMICAL NAME: ETHANE, 1,1,1-TRICHLORO-
SUBMISSION #: 8EHQ-0980-0365 8EHQ-0982-0457

CAS NUMBER: 111-44-4 CHEMICAL NAME: ETHANE, 1,1'-OXYBIS[2-CHLORO-
SUBMISSION #: 8EHQ-0682-0449 S

CAS NUMBER: 110-80-5 CHEMICAL NAME: ETHANOL, 2-ETHOXY-
SUBMISSION #: 8EHQ-0381-0386

CAS NUMBER: 111-15-9 CHEMICAL NAME: ETHANOL, 2-ETHOXY-, ACETATE
SUBMISSION #: 8EHQ-0682-0450

CAS NUMBER: 109-86-4 CHEMICAL NAME: ETHANOL, 2-METHOXY-
SUBMISSION #: 8EHQ-0281-0384

CAS NUMBER: 6175-45-7 CHEMICAL NAME: ETHANONE, 2,2-DIETHOXY-1-PHENYL-
SUBMISSION #: 8EHQ-0581-0400

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 75-01-4 CHEMICAL NAME: ETHENE, CHLORO-
SUBMISSION #: 8EHQ-0680-0345
8EHQ-0982-0457

CAS NUMBER: 127-18-4 CHEMICAL NAME: ETHENE, TETRACHLORO-
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 79-01-6 CHEMICAL NAME: ETHENE, TRICHLORO-
SUBMISSION #: 8EHQ-0680-0345
8EHQ-0982-0457

CAS NUMBER: 75-38-7 CHEMICAL NAME: ETHENE, 1,1-DIFLUORO-
SUBMISSION #: 8EHQ-0480-0337

CAS NUMBER: 156-60-5 CHEMICAL NAME: ETHENE, 1,2-DICHLORO-, (E)-
SUBMISSION #: 8EHQ-0680-0345
8EHQ-0982-0457

CAS NUMBER: 75-21-8 CHEMICAL NAME: ETHYLENE OXIDE
SUBMISSION #: 8EHQ-0882-0453

CAS NUMBER: 64742-11-6 CHEMICAL NAME: EXTRACTS (PETROLEUM), HEAVY NAPHTHENIC DISTILLATE SOLVENT
SUBMISSION #: 8EHQ-0281-0385

CAS NUMBER: 64742-04-7 CHEMICAL NAME: EXTRACTS (PETROLEUM), HEAVY PARAFFINIC DISTILLATE SOLVENT
SUBMISSION #: 8EHQ-0281-0385

CAS NUMBER: 129-79-3 CHEMICAL NAME: 9H-FLUOREN-9-ONE, 2,4,7-TRINITRO-
SUBMISSION #: 8EHQ-0480-0339

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

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CAS NUMBER:  NONE                        CHEMICAL NAME: FLUORORAD FC-143
          SUBMISSION #: 8EHQ-0381-0394 S

CAS NUMBER:  NONE                        CHEMICAL NAME: FLUORORAD FC-95
          SUBMISSION #: 8EHQ-1180-0374 S

CAS NUMBER:  7789-21-1                   CHEMICAL NAME: FLUOROSULFURIC ACID
          SUBMISSION #: 8EHQ-0881-0407

CAS NUMBER:  NONE                        CHEMICAL NAME: FR651
          SUBMISSION #: 8EHQ-0381-0393

CAS NUMBER:  108-30-5                    CHEMICAL NAME: 2,5-FURANDIONE, DIHYDRO-
          SUBMISSION #: 8EHQ-0282-0433    *

CAS NUMBER:  25377-73-5                  CHEMICAL NAME: 2,5-FURANDIONE, 3-(DODECENYL)DIHYDRO-
          SUBMISSION #: 8EHQ-0282-0432    *

CAS NUMBER:  13674-87-8                  CHEMICAL NAME: FYROL FR-2
          SUBMISSION #: 8EHQ-1280-0401 S

CAS NUMBER:  8006-61-9                   CHEMICAL NAME: GASOLINE, NATURAL
          SUBMISSION #: 8EHQ-1281-0422

CAS NUMBER:  8006-61-9                   CHEMICAL NAME: GASOLINE, UNLEADED
          SUBMISSION #: 8EHQ-1281-0422
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CAS NUMBER: NONE CHEMICAL NAME: GULFCUT HEAVY DUTY SOLUBLE OIL
SUBMISSION #: 8EHQ-0380-0335 S

CAS NUMBER: 64742-11-6 CHEMICAL NAME: GULF N.E. 61 (PROCESS 65)
SUBMISSION #: 8EHQ-0281-0385

CAS NUMBER: 64742-04-7 CHEMICAL NAME: GULF N.E. 75 (PROCESS 63)
SUBMISSION #: 8EHQ-0281-0385

CAS NUMBER: 64742-55-8 CHEMICAL NAME: GULF PARALUX 70
SUBMISSION #: 8EHQ-0681-0404

CAS NUMBER: NONE CHEMICAL NAME: GULF SUPERQUENCH 70
SUBMISSION #: 8EHQ-0281-0385

CAS NUMBER: NONE CHEMICAL NAME: GULF TS-905-HWCF
SUBMISSION #: 8EHQ-0982-0456 S *

CAS NUMBER: 64742-52-5 CHEMICAL NAME: GULF 100 TEXAS OIL
SUBMISSION #: 8EHQ-0281-0385

CAS NUMBER: NONE CHEMICAL NAME: HELOXY WC-68
SUBMISSION #: 8EHQ-0481-0397

CAS NUMBER: 68555-73-7 CHEMICAL NAME: 1-HEPTANESULFONAMIDE, N-ETHYL-1,1,2,2,3,3,4,4,5,5,6,6,7,7,7-PENTADECAFLUORO-N-(2-HYDROXYETHYL)-
SUBMISSION #: 8EHQ-1180-0373 S

CAS NUMBER: 58849-75-5 CHEMICAL NAME: HEXADECANOIC ACID, 2-SULFO-, 1-METHYL ESTER
SUBMISSION #: 8EHQ-0482-0442

CAS NUMBER: NONE CHEMICAL NAME: HIGH EXPLOSIVE (MIXTURE)
SUBMISSION #: 8EHQ-0581-0399 S

CAS NUMBER: NONE CHEMICAL NAME: HX 999
SUBMISSION #: 8EHQ-0480-0338

CAS NUMBER: NONE CHEMICAL NAME: HYBASE M-400
SUBMISSION #: 8EHQ-1081-0414

CAS NUMBER: NONE CHEMICAL NAME: HYDRAULIC FLUIDS
SUBMISSION #: 8EHQ-0780-0352

CAS NUMBER: 7783-06-4 CHEMICAL NAME: HYDROGEN SULFIDE
SUBMISSION #: 8EHQ-0580-0343

CAS NUMBER: 75-91-2 CHEMICAL NAME: HYDROPEROXIDE, 1,1-DIMETHYLETHYL
SUBMISSION #: 8EHQ-1081-0415

CAS NUMBER: 77-48-5 CHEMICAL NAME: 2,4-IMIDAZOLIDINEDIONE, 1,3-DIBROMO-5,5-DIMETHYL-
SUBMISSION #: 8EHQ-0281-0382

CAS NUMBER: 118-52-5 CHEMICAL NAME: 2,4-IMIDAZOLIDINEDIONE, 1,3-DICHLORO-5,5-DIMETHYL-
SUBMISSION #: 8EHQ-0281-0382

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 126-06-7 CHEMICAL NAME: 2,4-IMIDAZOLIDINEDIONE, 3-BROMO-1-CHLORO-5,5-DIMETHYL-
SUBMISSION #: 8EHQ-0281-0382

CAS NUMBER: 15336-82-0 CHEMICAL NAME: 2,4-IMIDAZOLIDINEDIONE, 5-ETHYL-5-METHYL-1,3-BIS(OXIRANYLMETHYL)-
SUBMISSION #: 8EHQ-1081-0418

CAS NUMBER: 15336-81-9 CHEMICAL NAME: 2,4-IMIDAZOLIDINEDIONE, 5,5-DIMETHYL-1,3-BIS(OXIRANYLMETHYL)
-
SUBMISSION #: 8EHQ-0481-0397

CAS NUMBER: 30947-30-9 CHEMICAL NAME: IRGASTAB 2002
SUBMISSION #: 8EHQ-0482-0443

CAS NUMBER: 7705-08-0 CHEMICAL NAME: IRON CHLORIDE
SUBMISSION #: 8EHQ-0880-0358 *

CAS NUMBER: NONE CHEMICAL NAME: I-122
SUBMISSION #: 8EHQ-1180-0375 S

CAS NUMBER: NONE CHEMICAL NAME: JET FUEL A
SUBMISSION #: 8EHQ-0181-0377

CAS NUMBER: 64741-67-9 CHEMICAL NAME: KERMAC 218A
SUBMISSION #: 8EHQ-0280-0333

CAS NUMBER: 64742-46-7   CHEMICAL NAME: KERMAC 600W
SUBMISSION #: 8EHQ-0280-0333

CAS NUMBER: 7439-92-1   CHEMICAL NAME: LEAD
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 330-55-2   CHEMICAL NAME: LINURON
SUBMISSION #: 8EHQ-0981-0409

CAS NUMBER: 7439-97-6   CHEMICAL NAME: MERCURY
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 62-75-9   CHEMICAL NAME: METHANAMINE, N-METHYL-N-NITROSO-
SUBMISSION #: 8EHQ-1280-0376

CAS NUMBER: 74-87-3   CHEMICAL NAME: METHANE, CHLORO-
SUBMISSION #: 8EHQ-1182-0464

CAS NUMBER: 75-09-2   CHEMICAL NAME: METHANE, DICHLORO-
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 75-71-8   CHEMICAL NAME: METHANE, DICHLORODIFLUORO-
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 624-83-9   CHEMICAL NAME: METHANE, ISOCYANATO-
SUBMISSION #: 8EHQ-0381-0392

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                          APPENDIX C:  STATUS REPORTS BY CHEMICAL NAME (CONT.)
CAS NUMBER:  76-06-2                    CHEMICAL NAME: METHANE, TRICHLORONITRO-
        SUBMISSION #: 8EHQ-1081-0416

CAS NUMBER:  25134-21-8                 CHEMICAL NAME: 4,7-METHANOISOBENZOFURAN-1,3-DIONE, 3A,4,7,7A-TETRAHYDROMETH
                                                       YL-
        SUBMISSION #: 8EHQ-0282-0431     *

CAS NUMBER:  77-73-6                    CHEMICAL NAME: 4,7-METHANO-1H-INDENE, 3A,4,7,7A-TETRAHYDRO-
        SUBMISSION #: 8EHQ-0980-0364

CAS NUMBER:  26472-00-4                 CHEMICAL NAME: 4,7-METHANO-1H-INDENE, 3A,4,7,7A-TETRAHYDRODIMETHYL-
        SUBMISSION #: 8EHQ-1081-0419

CAS NUMBER:  20354-26-1                 CHEMICAL NAME: METHAZOLE (TECHNICAL)
        SUBMISSION #: 8EHQ-0981-0409

CAS NUMBER:  26472-00-4                 CHEMICAL NAME: METHYLCYCLOPENTADIENE DIMER
        SUBMISSION #: 8EHQ-1081-0419

CAS NUMBER:  75-09-2                    CHEMICAL NAME: METHYLENE CHLORIDE
        SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER:  NONE                       CHEMICAL NAME: MISC. CHEMICALS
        SUBMISSION #: 8EHQ-0680-0344 P  *          8EHQ-0381-0386               8EHQ-0481-0397
                      8EHQ-0981-0409
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APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 102-77-2 CHEMICAL NAME: MORPHOLINE, 4-(2-BENZOTHIAZOLYLTHIO)-
SUBMISSION #: 8EHQ-0280-0334

CAS NUMBER: 13752-51-7 CHEMICAL NAME: MORPHOLINE, 4-[(4-MORPHOLINYLTHIO)THIOXOMETHYL]-
SUBMISSION #: 8EHQ-0280-0334

CAS NUMBER: 28768-32-3 CHEMICAL NAME: MY 720
SUBMISSION #: 8EHQ-0480-0338

CAS NUMBER: 25134-21-8 CHEMICAL NAME: NADIC METHYL ANHYDRIDE
SUBMISSION #: 8EHQ-0282-0431 *

CAS NUMBER: 6368-72-5 CHEMICAL NAME: 2-NAPHTHALENAMINE, N-ETHYL-1-[[4-(PHENYLAZO)PHENYL]AZO]-
SUBMISSION #: 8EHQ-0982-0455

CAS NUMBER: 6227-14-1 CHEMICAL NAME: 2-NAPHTHALENESULFONIC ACID, 4-HYDROXY-3-[[2-METHOXY-5-METHYL-4-[(4-SULFOPHENYL)AZO]PHENYL]AZO]-7-(PHENYLAMINO)-, DISODIUM SALT
SUBMISSION #: 8EHQ-0282-0437

CAS NUMBER: 64741-64-6 CHEMICAL NAME: NAPHTHA (PETROLEUM), FULL-RANGE ALKYLATE
SUBMISSION #: 8EHQ-0682-0446 S

CAS NUMBER: 64741-55-5 CHEMICAL NAME: NAPHTHA (PETROLEUM), LIGHT CATALYTIC CRACKED
SUBMISSION #: 8EHQ-0682-0446 S

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                              APPENDIX C:  STATUS REPORTS BY CHEMICAL NAME (CONT.)
CAS NUMBER:  64741-46-4                 CHEMICAL NAME: NAPHTHA (PETROLEUM), LIGHT STRAIGHT-RUN
         SUBMISSION #: 8EHQ-0682-0446 S

CAS NUMBER:  7440-02-0                  CHEMICAL NAME: NICKEL
         SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER:  NONE                       CHEMICAL NAME: NITROSAMINES
         SUBMISSION #: 8EHQ-1230-0376

CAS NUMBER:  CONFIDENT                  CHEMICAL NAME: NONAX 1166
         SUBMISSION #: 8EHQ-0280-0331 S

CAS NUMBER:  102-77-2                   CHEMICAL NAME: OBTS
         SUBMISSION #: 8EHQ-0280-0334

CAS NUMBER:  3076-26-4                  CHEMICAL NAME: OCTADECANOIC ACID, 2-SULFO-, 1-METHYL ESTER
         SUBMISSION #: 8EHQ-0482-0442

CAS NUMBER:  UNKNOWN                    CHEMICAL NAME: 9-OCTADECENOIC ACID, (Z)-, 3-[(1-OXO-2-PROPENYL)OXY]-2,2-BIS
         SUBMISSION #: 8EHQ-1082-0460                  [[(1-OXO-2-PROPENYL)OXY]METHYL]PROPYL ESTER

CAS NUMBER:  1691-99-2                  CHEMICAL NAME: 1-OCTANESULFONAMIDE, N-ETHYL-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8
         SUBMISSION #: 8EHQ-1180-0373 S                ,8-HEPTADECAFLUORO-N-(2-HYDROXYETHYL)-
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APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: NONE CHEMICAL NAME: OIL, GULFCUT HEAVY DUTY SOLUBLE
SUBMISSION #: 8EHQ-0380-0335 S

CAS NUMBER: NONE CHEMICAL NAME: OIL (PETROLEUM), NEW MOTOR
SUBMISSION #: 8EHQ-0381-0389

CAS NUMBER: UNKNOWN CHEMICAL NAME: OIL (PETROLEUM), NUMBER 6 HEAVY FUEL
SUBMISSION #: 8EHQ-0181-0377

CAS NUMBER: NONE CHEMICAL NAME: OIL (PETROLEUM), USED MOTOR
SUBMISSION #: 8EHQ-0381-0389

CAS NUMBER: NONE CHEMICAL NAME: OIL (SHALE), FULL-RANGE DEWAXED SYNCRUDE
SUBMISSION #: 8EHQ-1081-0417

CAS NUMBER: NONE CHEMICAL NAME: OIL (SHALE), REDUCED SYNCRUDE
SUBMISSION #: 8EHQ-1081-0417

CAS NUMBER: 2481-94-9 CHEMICAL NAME: OIL YELLOW E190
SUBMISSION #: 8EHQ-0982-0455

CAS NUMBER: 20354-26-1 CHEMICAL NAME: 1,2,4-OXADIAZOLIDINE-3,5-DIONE,
SUBMISSION #: 8EHQ-0981-0409

CAS NUMBER: 75-21-8 CHEMICAL NAME: OXIRANE
SUBMISSION #: 8EHQ-0882-0453

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 28768-32-3 CHEMICAL NAME: OXIRANEMETHANAMINE, N,N'-(METHYLENEDI-4,1-PHENYLENE)BIS[N-(OXIRANYLMETHYL)-

SUBMISSION #: 8EHQ-0480-0338

CAS NUMBER: 5026-74-4 CHEMICAL NAME: OXIRANEMETHANAMINE, N-[4-(OXIRANYLMETHOXY)PHENYL]-N-(OXIRANYLMETHYL)-

SUBMISSION #: 8EHQ-1281-0426

CAS NUMBER: 75-56-9 CHEMICAL NAME: OXIRANE, METHYL-

SUBMISSION #: 8EHQ-0282-0439

CAS NUMBER: 17557-23-2 CHEMICAL NAME: OXIRANE, 2,2'-[(2,2-DIMETHYL-1,3-PROPANEDIYL)BIS(OXYMETHYLENE)]BIS-

SUBMISSION #: 8EHQ-0481-0397

CAS NUMBER: NONE CHEMICAL NAME: PARANOX 52

SUBMISSION #: 8EHQ-0381-0388 S

CAS NUMBER: 53417-29-1 CHEMICAL NAME: PENTAERYTHRITOL DIACRYLATE

SUBMISSION #: 8EHQ-0882-0454

CAS NUMBER: UNKNOWN CHEMICAL NAME: PENTAERYTHRITOL MONOOLEATE TRIACRYLATE

SUBMISSION #: 8EHQ-1082-0460

CAS NUMBER: 2215-35-2 CHEMICAL NAME: 2-PENTANOL, 4-METHYL-, HYDROGEN PHOSPHORODITHIOATE, ZINC SALT

SUBMISSION #: 8EHQ-0680-0346

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: CONFIDENT CHEMICAL NAME: PERFLUOROALKYL CARBOXYLIC ACID, AMMONIUM SALTS
SUBMISSION #: 8EHQ-0381-0394 S

CAS NUMBER: CONFIDENT CHEMICAL NAME: PERFLUOROALKYL CARBOXYLIC ACIDS
SUBMISSION #: 8EHQ-0381-0394 S

CAS NUMBER: NONE CHEMICAL NAME: PERFLUOROALKYL COMPOUNDS
SUBMISSION #: 8EHQ-1180-0373 S 8EHQ-1180-0374 S 8EHQ-0381-0394 S

CAS NUMBER: CONFIDENT CHEMICAL NAME: PERFLUOROALKYL SULFONATES, POTASSIUM SALTS
SUBMISSION #: 8EHQ-1180-0374 S

CAS NUMBER: 64742-16-1 CHEMICAL NAME: PETROLEUM RESINS
SUBMISSION #: 8EHQ-0281-0385

CAS NUMBER: CONFIDENT CHEMICAL NAME: PHENOL SULFIDE, ALKYLATED-, CALCIUM SALT
SUBMISSION #: 8EHQ-0381-0388 S

CAS NUMBER: 25167-82-2 CHEMICAL NAME: PHENOL, TRICHLORO-
SUBMISSION #: 8EHQ-0381-0390

CAS NUMBER: 868-85-9 CHEMICAL NAME: PHOSPHONIC ACID, DIMETHYL ESTER
SUBMISSION #: 8EHQ-1080-0366

CAS NUMBER: 30947-30-9 CHEMICAL NAME: PHOSPHONIC ACID, [[3,5-BIS(1,1-DIMETHYLETHYL)-4-HYDROXYPHENYL]METHYL]-, MONOETHYL ESTER, NICKEL(2+) SALT (2:1)
SUBMISSION #: 8EHQ-0482-0443

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 10310-38-0 CHEMICAL NAME: PHOSPHONIUM, 1,2-ETHANEDIYLBIS[TRIS(2-CYANOETHYL)-, DIBROMIDE
SUBMISSION #: 8EHQ-0780-0369

CAS NUMBER: 993-43-1 CHEMICAL NAME: PHOSPHONOTHIOIC DICHLORIDE, ETHYL-
SUBMISSION #: 8EHQ-0981-0412

CAS NUMBER: 2524-03-0 CHEMICAL NAME: PHOSPHOROCHLORIDOTHIOIC ACID, O,O-DIMETHYL ESTER
SUBMISSION #: 8EHQ-0381-0387

CAS NUMBER: CONFIDENT CHEMICAL NAME: PHOSPHORODITHIOIC ACID, DIALKYL ESTERS, ZINC SALT
SUBMISSION #: 8EHQ-0781-0405 S

CAS NUMBER: 68442-22-8 CHEMICAL NAME: PHOSPHORODITHIOIC ACID, MIXED 2-ETHYLHEXYL AND 2-METHYLPROPYL ESTERS, ZINC SALTS
SUBMISSION #: 8EHQ-0680-0346

CAS NUMBER: CONFIDENT CHEMICAL NAME: PHOSPHORODITHIOIC ACID, O,O'-DIALKYL ESTER, ANTIMONY SALT
SUBMISSION #: 8EHQ-1281-0425 S

CAS NUMBER: UNKNOWN CHEMICAL NAME: PHOSPHORODITHIOIC ACID, O,O'-DI(ISOHEXYL, ISOHEPTYL, ISOOCTYL, ISONONYL, ISODECYL)MIXED ESTERS, ZINC SALT
SUBMISSION #: 8EHQ-0181-0379

CAS NUMBER: UNKNOWN CHEMICAL NAME: PHOSPHORODITHIOIC ACID, (SECONDARY BUTYL AND ISOOCTYL)MIXED ESTERS, ZINC SALT
SUBMISSION #: 8EHQ-0181-0379

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

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CAS NUMBER:  101-02-0                  CHEMICAL NAME: PHOSPHOROUS ACID, TRIPHENYL ESTER

          SUBMISSION #: 8EHQ-0682-0451

CAS NUMBER:  NONE                      CHEMICAL NAME: PHOTOCOPYING PRODUCTS/PROCESS

          SUBMISSION #: 8EHQ-0480-0339                8EHQ-0780-0351

CAS NUMBER:  68187-58-6                CHEMICAL NAME: PITCH, PETROLEUM, CONDENSED-RING AROM.

          SUBMISSION #: 8EHQ-0780-0353

CAS NUMBER:  9003-01-4                 CHEMICAL NAME: POLYACRYLIC ACID

          SUBMISSION #: 8EHQ-0382-0438 S

CAS NUMBER:  UNKNOWN                   CHEMICAL NAME: POLYACRYLIC ACID, PARTIAL ALUMINUM POTASSIUM SALT

          SUBMISSION #: 8EHQ-0382-0438 S

CAS NUMBER:  UNKNOWN                   CHEMICAL NAME: POLYACRYLIC ACID, PARTIAL SODIUM SALT

          SUBMISSION #: 8EHQ-0382-0438 S

CAS NUMBER:  NONE                      CHEMICAL NAME: POLYALKOXYLATED POLYAMINES

          SUBMISSION #: 8EHQ-0280-0331 S              8EHQ-0380-0336 S

CAS NUMBER:  1336-36-3                 CHEMICAL NAME: POLYCHLORINATED BIPHENYLS (PCB)

          SUBMISSION #: 8EHQ-0780-0352                8EHQ-0981-0413                 8EHQ-0982-0457

CAS NUMBER:  UNKNOWN                   CHEMICAL NAME: POLY [N,N'-BIS(2,2,6,6-TETRAMETHYLPIPERID-4-YL)-N-(4-(1,1,3,
                                                      3-TETRAMETHYLBUTYLAMINO)-1,3,5-TRIAZINE-2,6-DIYL)HEXAMETHYLE
                                                      NEDIAMINE

          SUBMISSION #: 8EHQ-0480-0340
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APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: NONE CHEMICAL NAME: POLYNUCLEAR AROMATIC HYDROCARBONS
SUBMISSION #: 8EHQ-0381-0389

CAS NUMBER: CONFIDENT CHEMICAL NAME: POLYQUART H
SUBMISSION #: 8EHQ-0280-0331 S

CAS NUMBER: UNKNOWN CHEMICAL NAME: PROPANE, DIBROMOCHLOROMETHYL-
SUBMISSION #: 8EHQ-1281-0420

CAS NUMBER: 25038-04-4 CHEMICAL NAME: 1,2,3-PROPANETRIOL, POLYMER WITH (CHLOROMETHYL)OXIRANE
SUBMISSION #: 8EHQ-0781-0406 S

CAS NUMBER: 709-98-8 CHEMICAL NAME: PROPANIL
SUBMISSION #: 8EHQ-0981-0409

CAS NUMBER: 2997-92-4 CHEMICAL NAME: PROPANIMIDAMIDE, 2,2'-AZOBIS[2-METHYL-, DIHYDROCHLORIDE
SUBMISSION #: 8EHQ-0282-0427 S

CAS NUMBER: 68479-77-6 CHEMICAL NAME: PROPANOIC ACID, 2,3-DIBROMO-, 2-HYDROXYETHYL ESTER
SUBMISSION #: 8EHQ-0381-0391

CAS NUMBER: 67-63-0 CHEMICAL NAME: 2-PROPANOL
SUBMISSION #: 8EHQ-1180-0371

CAS NUMBER: 13674-87-8 CHEMICAL NAME: 2-PROPANOL, 1,3-DICHLORO-, PHOSPHATE (3:1)
SUBMISSION #: 8EHQ-1280-0101 S

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 93-55-0 CHEMICAL NAME: 1-PROPANONE, 1-PHENYL-
SUBMISSION #: 8EHQ-0580-0341

CAS NUMBER: 110-26-9 CHEMICAL NAME: 2-PROPENAMIDE, N,N'-METHYLENEBIS-
SUBMISSION #: 8EHQ-0880-0357

CAS NUMBER: 140-88-5 CHEMICAL NAME: 2-PROPENOIC ACID, ETHYL ESTER
SUBMISSION #: 8EHQ-1282-0467

CAS NUMBER: 9003-01-4 CHEMICAL NAME: 2-PROPENOIC ACID, HOMOPOLYMER
SUBMISSION #: 8EHQ-0382-0438 S

CAS NUMBER: 57472-68-1 CHEMICAL NAME: 2-PROPENOIC ACID, OXYBIS(METHYL-2,1-ETHANEDIYL) ESTER
SUBMISSION #: 8EHQ-1082-0459

CAS NUMBER: 17831-71-9 CHEMICAL NAME: 2-PROPENOIC ACID, OXYBIS(2,1-ETHANEDIYLOXY-2,1-ETHANEDIYL) ESTER
SUBMISSION #: 8EHQ-0981-0411

CAS NUMBER: 1680-21-3 CHEMICAL NAME: 2-PROPENOIC ACID, 1,2-ETHANEDIYLBIS(OXY-2,1-ETHANEDIYL) ESTER
SUBMISSION #: 8EHQ-0981-0410

CAS NUMBER: 818-61-1 CHEMICAL NAME: 2-PROPENOIC ACID, 2-HYDROXYETHYL ESTER
SUBMISSION #: 8EHQ-0880-0356

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 3524-68-3 CHEMICAL NAME: 2-PROPENOIC ACID, 2-(HYDROXYMETHYL)-2-[[(1-OXO-2-PROPENYL)OXY]METHYL]-1,3-PROPANEDIYL ESTER
SUBMISSION #: 8EHQ-0882-0454

CAS NUMBER: 4986-89-4 CHEMICAL NAME: 2-PROPENOIC ACID, 2,2-BIS[[(1-OXO-2-PROPENYL)OXY]METHYL]-1,3-PROPANEDIYL ESTER
SUBMISSION #: 8EHQ-0882-0454

CAS NUMBER: 107-18-6 CHEMICAL NAME: 2-PROPEN-1-OL
SUBMISSION #: 8EHQ-0181-0381

CAS NUMBER: 709-98-8 CHEMICAL NAME: PROPIONAMIDE, N-(3,4-DICHLOROPHENYL)-
SUBMISSION #: 8EHQ-0981-0409

CAS NUMBER: 75-56-9 CHEMICAL NAME: PROPYLENE OXIDE
SUBMISSION #: 8EHQ-0282-0439

CAS NUMBER: 3445-11-2 CHEMICAL NAME: 2-PYRROLIDINONE, 1-(2-HYDROXYETHYL)-
SUBMISSION #: 8EHQ-0682-0448 S

CAS NUMBER: 14808-60-7 CHEMICAL NAME: QUARTZ
SUBMISSION #: 8EHQ-0780-0354

CAS NUMBER: NONE CHEMICAL NAME: RADIOACTIVE MATERIALS
SUBMISSION #: 8EHQ-0880-0358 *

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 81-88-9 CHEMICAL NAME: D&C RED NO. 19
SUBMISSION #: 8EHQ-0282-0434

CAS NUMBER: 64741-67-9 CHEMICAL NAME: RESIDUES (PETROLEUM), CATALYTIC REFORMER FRACTIONATOR
SUBMISSION #: 8EHQ-0280-0333

CAS NUMBER: 81-88-9 CHEMICAL NAME: RHODAMINE B
SUBMISSION #: 8EHQ-0282-0434

CAS NUMBER: NONE CHEMICAL NAME: RODINE 50
SUBMISSION #: 8EHQ-0680-0348

CAS NUMBER: NONE CHEMICAL NAME: RODINE 500
SUBMISSION #: 8EHQ-0680-0348

CAS NUMBER: NONE CHEMICAL NAME: RODINE 51
SUBMISSION #: 8EHQ-0680-0348

CAS NUMBER: NONE CHEMICAL NAME: RODINE 85
SUBMISSION #: 8EHQ-0680-0348

CAS NUMBER: NONE CHEMICAL NAME: RODINE 95
SUBMISSION #: 8EHQ-0680-0348

CAS NUMBER: NONE CHEMICAL NAME: RODINE 96
SUBMISSION #: 8EHQ-0680-0348

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 68441-14-5 CHEMICAL NAME: RUBBER, BROMINATED BUTYL-
SUBMISSION #: 8EHQ-1281-0420

CAS NUMBER: 7782-49-2 CHEMICAL NAME: SELENIUM
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 68308-34-9 CHEMICAL NAME: SHALE OILS
SUBMISSION #: 8EHQ-1081-0417

CAS NUMBER: 3388-04-3 CHEMICAL NAME: SILANE A-186
SUBMISSION #: 8EHQ-0681-0402

CAS NUMBER: 2487-90-3 CHEMICAL NAME: SILANE, TRIMETHOXY-
SUBMISSION #: 8EHQ-0680-0347

CAS NUMBER: 3388-04-3 CHEMICAL NAME: SILANE, TRIMETHOXY[2-(7-OXABICYCLO[4.1.0]HEPT-3-YL)ETHYL]-
SUBMISSION #: 8EHQ-0681-0402

CAS NUMBER: 63231-67-4 CHEMICAL NAME: SILICA GEL
SUBMISSION #: 8EHQ-0780-0354

CAS NUMBER: 67762-92-9 CHEMICAL NAME: SILICONE Y-6607
SUBMISSION #: 8EHQ-0680-0349

CAS NUMBER: 67762-92-9 CHEMICAL NAME: SILOXANES AND SILICONES, DI-ME, DIMETHYLAMINO-TERMINATED
SUBMISSION #: 8EHQ-0680-0349

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 7440-22-4 CHEMICAL NAME: SILVER
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 1313-82-2 CHEMICAL NAME: SODIUM SULFIDE
SUBMISSION #: 8EHQ-0282-0435

CAS NUMBER: UNKNOWN CHEMICAL NAME: SODYECRON BLUE GBL
SUBMISSION #: 8EHQ-0481-0396 *

CAS NUMBER: 6368-72-5 CHEMICAL NAME: C. I. SOLVENT RED 19
SUBMISSION #: 8EHQ-0982-0455

CAS NUMBER: 2481-94-9 CHEMICAL NAME: C. I. SOLVENT YELLOW 56
SUBMISSION #: 8EHQ-0982-0455

CAS NUMBER: NONE CHEMICAL NAME: SRC PROCESS/PRODUCTS
SUBMISSION #: 8EHQ-0980-0363 8EHQ-0581-0398

CAS NUMBER: CONFIDENT CHEMICAL NAME: STANAX 1166
SUBMISSION #: 8EHQ-0380-0336 S

CAS NUMBER: UNKNOWN CHEMICAL NAME: STEARYLPHENYLETHYLDIMETHYL AMMONIUM P-TOLUENE SULFONATE
SUBMISSION #: 8EHQ-0881-0408 S *

CAS NUMBER: NONE CHEMICAL NAME: STEPAN AGENT 291-83
SUBMISSION #: 8EHQ-0482-0442

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: 61789-87-5
CHEMICAL NAME: SULFONIC ACIDS, PETROLEUM, MAGNESIUM SALTS
SUBMISSION #: 8EHQ-1081-0414

CAS NUMBER: 7446-09-5
CHEMICAL NAME: SULFUR DIOXIDE
SUBMISSION #: 8EHQ-0181-0378

CAS NUMBER: 77-78-1
CHEMICAL NAME: SULFURIC ACID, DIMETHYL ESTER
SUBMISSION #: 8EHQ-0482-0442

CAS NUMBER: 127-18-4
CHEMICAL NAME: TETRACHLOROETHYLENE
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 29454-23-7
CHEMICAL NAME: TETRADECANOIC ACID, 2-SULFO-, 1-METHYL ESTER
SUBMISSION #: 8EHQ-0482-0442

CAS NUMBER: 7440-28-0
CHEMICAL NAME: THALLIUM
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: 1072-71-5
CHEMICAL NAME: 1,3,4-THIADIAZOLIDINE-2,5-DITHIONE
SUBMISSION #: 8EHQ-0181-0380 *

CAS NUMBER: UNKNOWN
CHEMICAL NAME: THIOXANTHEN-9-ONE, 2-DODECYL-9-H-
SUBMISSION #: 8EHQ-0582-0445

CAS NUMBER: UNKNOWN
CHEMICAL NAME: THORNEL MAT
SUBMISSION #: 8EHQ-1281-0423

APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

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CAS NUMBER:  UNKNOWN                    CHEMICAL NAME: THORNEL TYPE P (HIGH MODULUS)
           SUBMISSION #: 8EHQ-1281-0423

CAS NUMBER:  108-88-3                   CHEMICAL NAME: TOLUENE
           SUBMISSION #: 8EHQ-0680-0345                8EHQ-1080-0368

CAS NUMBER:  98-51-1                    CHEMICAL NAME: TOLUENE, P-TERT-BUTYL-
           SUBMISSION #: 8EHQ-1281-0421 S

CAS NUMBER:  95-53-4                    CHEMICAL NAME: TOLUIDINE (ORTHO)
           SUBMISSION #: 8EHQ-0680-0348

CAS NUMBER:  79-01-6                    CHEMICAL NAME: TRICHLOROETHYLENE
           SUBMISSION #: 8EHQ-0680-0345                8EHQ-0982-0457

CAS NUMBER:  129-79-3                   CHEMICAL NAME: 2,4,7-TRINITROFLUORENONE
           SUBMISSION #: 8EHQ-0480-0339

CAS NUMBER:  330-55-2                   CHEMICAL NAME: UREA, N'-(3,4-DICHLOROPHENYL)-N-METHOXY-N-METHYL-
           SUBMISSION #: 8EHQ-0981-0409

CAS NUMBER:  330-54-1                   CHEMICAL NAME: UREA, N'-(3,4-DICHLOROPHENYL)-N,N-DIMETHYL-
           SUBMISSION #: 8EHQ-0981-0409

CAS NUMBER:  6175-45-7                  CHEMICAL NAME: U-2352
           SUBMISSION #: 8EHQ-0581-0400
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APPENDIX C: STATUS REPORTS BY CHEMICAL NAME (CONT.)

CAS NUMBER: NONE CHEMICAL NAME: VARISOFT 222 (90%)
SUBMISSION #: 8EHQ-1180-0371

CAS NUMBER: 75-01-4 CHEMICAL NAME: VINYL CHLORIDE
SUBMISSION #: 8EHQ-0680-0345 8EHQ-0982-0457

CAS NUMBER: 2997-92-4 CHEMICAL NAME: V-50
SUBMISSION #: 8EHQ-0282-0427 S

CAS NUMBER: NONE CHEMICAL NAME: WYNN'S FRICTION PROOFING FLUID
SUBMISSION #: 8EHQ-0780-0352

CAS NUMBER: NONE CHEMICAL NAME: XB 2793
SUBMISSION #: 8EHQ-0481-0397

CAS NUMBER: 15336-82-0 CHEMICAL NAME: XU-238
SUBMISSION #: 8EHQ-1081-0418

CAS NUMBER: 7440-66-6 CHEMICAL NAME: ZINC
SUBMISSION #: 8EHQ-0680-0345

CAS NUMBER: NONE CHEMICAL NAME: ZINC DIALKYL DITHIOPHOSPHATES (ZDDP)
SUBMISSION #: 8EHQ-0680-0346 8EHQ-0181-0379 8EHQ-0781-0405 S

CAS NUMBER: NONE CHEMICAL NAME: ZYTEL NYLON RESIN PURGING PROCESS
SUBMISSION #: 8EHQ-0680-0344 P *

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* Based on a preliminary evaluation, EPA believes that the submitted information did not warrant reporting pursuant to Section 8(e) of TSCA. In some cases, a submitting company was requested to provide the basis for its contention that the reported information offered reasonable support for a conclusion of substantial risk of injury to health and/or the environment as defined in EPA's March 16, 1978, TSCA Section 8(e) policy statement (Appendix A of this volume).

APPENDIX D: STATUS REPORTS BY INFORMATION TYPE

ACUTE TOXICITY (ANIMAL)

SUBMISSION #:	8EHQ-0380-0335 S		8EHQ-0480-0340		8EHQ-0680-0347	
	8EHQ-0680-0349		8EHQ-0980-0359		8EHQ-0980-0362	
	8EHQ-0980-0365		8EHQ-0780-0369		8EHQ-1180-0372	
	8EHQ-0181-0380	*	8EHQ-0181-0381		8EHQ-0281-0382	
	8EHQ-0381-0392		8EHQ-0581-0398		8EHQ-0581-0400	
	8EHQ-0881-0408 S	*	8EHQ-0981-0409		8EHQ-1081-0417	
	8EHQ-1081-0418		8EHQ-0282-0427 S		8EHQ-0282-0428	*
	8EHQ-0282-0429	*	8EHQ-0282-0430	*	8EHQ-0282-0431	*
	8EHQ-0282-0432	*	8EHQ-0282-0433	*	8EHQ-0282-0435	
	8EHQ-0282-0436	*	8EHQ-0282-0437		8EHQ-0382-0438 S	
	8EHQ-0382-0440 S		8EHQ-0682-0448 S		8EHQ-0982-0456 S	*
	8EHQ-1082-0459		8EHQ-1082-0460		8EHQ-1182-0462	

ACUTE TOXICITY (HUMAN)

SUBMISSION #:	8EHQ-0280-0333		8EHQ-0480-0338		8EHQ-0580-0341	
	8EHQ-0680-0344 P	*	8EHQ-0880-0355		8EHQ-0881-0407	
	8EHQ-0981-0409		8EHQ-1182-0466	*		

ALLERGENICITY (ANIMAL)

SUBMISSION #:	8EHQ-0480-0340	8EHQ-1180-0371	8EHQ-0281-0382
	8EHQ-0282-0427 S	8EHQ-0682-0448 S	8EHQ-1182-0462

ALLERGENICITY (HUMAN)

SUBMISSION #:	8EHQ-0880-0355	8EHQ-0282-0427 S

APPENDIX D: STATUS REPORTS BY INFORMATION TYPE (CONT.)

CELL TRANSFORMATION (IN VITRO)

SUBMISSION #: 8EHQ-0280-0334 8EHQ-0281-0385 8EHQ-1280-0401 S
8EHQ-0681-0404 8EHQ-0981-0412 8EHQ-1081-0415
8EHQ-1081-0418 8EHQ-0982-0455

CHEMICAL/PHYSICAL PROPERTIES

SUBMISSION #: 8EHQ-0280-0333 8EHQ-0480-0340 8EHQ-0680-0348
8EHQ-0382-0440 S

CHRONIC TOXICITY (ANIMAL)

SUBMISSION #: 8EHQ-0580-0342 8EHQ-0282-0439 8EHQ-1282-0467

CHRONIC TOXICITY (HUMAN)

SUBMISSION #: 8EHQ-0981-0409

DNA REPAIR (IN VITRO)

SUBMISSION #: 8EHQ-0280-0334

ECOTOXICITY/AQUATIC TOXICITY

SUBMISSION #: 8EHQ-0881-0407

EMERGENCY INCIDENT OF ENV. CONTAMINATION

SUBMISSION #: 8EHQ-0580-0343 8EHQ-0181-0378 8EHQ-0881-0407
8EHQ-1182-0466 *

ENV. OCCURRENCE/RELEASE/FATE

SUBMISSION #: 8EHQ-0580-0343 8EHQ-0680-0345 8EHQ-0880-0358 *

APPENDIX D: STATUS REPORTS BY INFORMATION TYPE (CONT.)

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ENV. OCCURRENCE/RELEASE/FATE (CONT.)
          SUBMISSION #:  8EHQ-1080-0368            8EHQ-0881-0407            8EHQ-0981-0409
                         8EHQ-0981-0413            8EHQ-1081-0416            8EHQ-0982-0457
                         8EHQ-1182-0462            8EHQ-1182-0466     *

EPIDEMIOLOGY/CLINICAL
          SUBMISSION #:  8EHQ-0280-0332            8EHQ-0580-0341            8EHQ-1080-0366
                         8EHQ-1080-0367            8EHQ-0381-0390            8EHQ-1280-0401 S
                         8EHQ-0282-0427 S          8EHQ-0382-0440 S          8EHQ-0582-0444

GROUNDWATER CONTAMINATION
          SUBMISSION #:  8EHQ-0680-0345            8EHQ-1080-0368            8EHQ-0982-0457

HUMAN EXPOSURE (ACCIDENTAL)
          SUBMISSION #:  8EHQ-0480-0338            8EHQ-0580-0341            8EHQ-0580-0343
                         8EHQ-0381-0390            8EHQ-0981-0413            8EHQ-1081-0416
                         8EHQ-1182-0466     *

HUMAN EXPOSURE (MONITORING)
          SUBMISSION #:  8EHQ-0280-0331 S          8EHQ-0380-0336 S          8EHQ-0580-0343
                         8EHQ-0680-0345            8EHQ-0680-0348            8EHQ-1080-0367
                         8EHQ-1080-0368            8EHQ-1280-0401 S          8EHQ-0382-0440 S
                         8EHQ-0482-0442            8EHQ-0982-0457            8EHQ-1182-0462

HUMAN EXPOSURE (PRODUCT CONTAMINATION)
          SUBMISSION #:  8EHQ-0280-0331 S          8EHQ-0380-0336 S          8EHQ-0680-0348
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APPENDIX D: STATUS REPORTS BY INFORMATION TYPE (CONT.)

HUMAN EXPOSURE (PRODUCT CONTAMINATION) (CONT.)

SUBMISSION #:	8EHQ-0780-0352	8EHQ-0880-0358 *	8EHQ-1280-0376
	8EHQ-0381-0390	8EHQ-0981-0409	8EHQ-1281-0420
	8EHQ-0482-0442	8EHQ-0682-0449 S	

METABOLISM/PHARMACOKINETICS (ANIMAL)

SUBMISSION #:	8EHQ-0780-0350	8EHQ-1280-0401 S	

MUTAGENICITY (IN VITRO)

SUBMISSION #:	8EHQ-0280-0333	8EHQ-0280-0334	8EHQ-0480-0339
	8EHQ-0480-0340	8EHQ-0780-0350	8EHQ-0780-0351
	8EHQ-0980-0359	8EHQ-0980-0361 S	8EHQ-0980-0363
	8EHQ-1080-0366	8EHQ-0281-0383 S *	8EHQ-0281-0385
	8EHQ-0381-0391	8EHQ-0481-0396 *	8EHQ-0581-0400
	8EHQ-0681-0402	8EHQ-0681-0403 S	8EHQ-0681-0404
	8EHQ-0781-0406 S	8EHQ-0981-0412	8EHQ-1081-0415
	8EHQ-1081-0417	8EHQ-1081-0418	8EHQ-1281-0426
	8EHQ-0282-0427 S	8EHQ-0682-0448 S	8EHQ-0982-0455
	8EHQ-0982-0458	8EHQ-1082-0459	8EHQ-1082-0460
	8EHQ-1182-0465		

MUTAGENICITY (IN VIVO)

SUBMISSION #:	8EHQ-0780-0350	8EHQ-1080-0366	8EHQ-0281-0384
	8EHQ-0381-0387	8EHQ-0981-0412	8EHQ-1081-0418
	8EHQ-1281-0426		

APPENDIX D: STATUS REPORTS BY INFORMATION TYPE (CONT.)

NEUROTOXICITY (ANIMAL)

SUBMISSION #: 8EHQ-0880-0356   8EHQ-0880-0357   8EHQ-0780-0369
8EHQ-0382-0440 S   8EHQ-0682-0451   8EHQ-1182-0462

NEUROTOXICITY (HUMAN)

SUBMISSION #: 8EHQ-0480-0338

ONCOGENICITY (ANIMAL)

SUBMISSION #: 8EHQ-0480-0337   8EHQ-0580-0342   8EHQ-0780-0350
8EHQ-0780-0353   8EHQ-0980-0360   8EHQ-1080-0370
8EHQ-0381-0389   8EHQ-0381-0393   8EHQ-0481-0397
8EHQ-0581-0400   8EHQ-1280-0401 S   8EHQ-0681-0402
8EHQ-0981-0410   8EHQ-0981-0411   8EHQ-1281-0422
8EHQ-1281-0423   8EHQ-0282-0434   8EHQ-0282-0439
8EHQ-0482-0443   8EHQ-0682-0447   8EHQ-0882-0453
8EHQ-0882-0454   8EHQ-1082-0461   8EHQ-1182-0463
8EHQ-1282-0467

ONCOGENICITY (HUMAN)

SUBMISSION #: 8EHQ-0582-0444

PRODUCT COMPOSITION/CHEMICAL IDENTITY

SUBMISSION #: 8EHQ-0280-0331 S   8EHQ-0280-0333   8EHQ-0380-0335 S
8EHQ-0380-0336 S   8EHQ-0780-0350   8EHQ-1180-0375 S
8EHQ-0581-0399 S   8EHQ-0781-0406 S   8EHQ-0482-0442

APPENDIX D: STATUS REPORTS BY INFORMATION TYPE (CONT.)

PRODUCT COMPOSITION/CHEMICAL IDENTITY (CONT.)

SUBMISSION #:	8EHQ-0682-0446 S	8EHQ-0882-0454	8EHQ-0982-0456 S *

REPRODUCTIVE TOXICITY/TERATO. (ANIMAL)

SUBMISSION #:	8EHQ-0680-0346	8EHQ-1180-0373 S	8EHQ-1180-0374 S
	8EHQ-1180-0375 S	8EHQ-0181-0379	8EHQ-0281-0384
	8EHQ-0381-0386	8EHQ-0381-0388 S	8EHQ-0381-0394 S
	8EHQ-0581-0399 S	8EHQ-0781-0405 S	8EHQ-1081-0414
	8EHQ-1281-0421 S	8EHQ-1281-0424	8EHQ-0382-0440 S
	8EHQ-0382-0441	8EHQ-0682-0450	8EHQ-0882-0452
	8EHQ-1182-0462	8EHQ-1182-0464	

REPRODUCTIVE TOXICITY/TERATO. (HUMAN)

SUBMISSION #:	8EHQ-1080-0367	8EHQ-0382-0440 S

SUBACUTE TOXICITY (ANIMAL)

SUBMISSION #:	8EHQ-0680-0346	8EHQ-1080-0366	8EHQ-0780-0369
	8EHQ-0181-0377	8EHQ-0281-0384	8EHQ-0381-0392
	8EHQ-1081-0419	8EHQ-1281-0425 S	8EHQ-0382-0438 S
	8EHQ-0582-0445	8EHQ-0682-0446 S	8EHQ-1182-0462

SUBCHRONIC TOXICITY (ANIMAL)

SUBMISSION #:	8EHQ-0680-0347	8EHQ-0780-0354	8EHQ-0980-0364
	8EHQ-0281-0384	8EHQ-0682-0446 S	

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* Based on a preliminary evaluation, EPA believes that the submitted information did not warrant reporting pursuant to Section 8(e) of TSCA. In some cases, a submitting company was requested to provide the basis for its contention that the reported information offered reasonable support for a conclusion of substantial risk of injury to health and/or the environment as defined in EPA's March 16, 1978, TSCA Section 8(e) policy statement (Appendix A of this volume).

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER

8EHQ-0280-0331 S SUBMITTER: HENKEL CORPORATION
CAS NUMBER: CONFIDENT CHEMICAL NAME: NONAX 1166
CAS NUMBER: CONFIDENT CHEMICAL NAME: POLYQUART H
CAS NUMBER: NONE CHEMICAL NAME: POLYALKOXYLATED POLYAMINES
CAS NUMBER: 123-91-1 CHEMICAL NAME: 1,4-DIOXANE

8EHQ-0280-0332 SUBMITTER: INTERNATIONAL LEAD ZINC RESEARCH ORGANIZATION INC.
CAS NUMBER: 7440-43-9 CHEMICAL NAME: CADMIUM

8EHQ-0280-0333 SUBMITTER: KERR-MCGEE CORPORATION
CAS NUMBER: 64741-67-9 CHEMICAL NAME: KERMAC 218A
CAS NUMBER: 64741-67-9 CHEMICAL NAME: RESIDUES (PETROLEUM), CATALYTIC REFORMER FRACTIONATOR
CAS NUMBER: 64742-46-7 CHEMICAL NAME: DISTILLATES (PETROLEUM), HYDROTREATED MIDDLE
CAS NUMBER: 64742-46-7 CHEMICAL NAME: KERMAC 600W

8EHQ-0280-0334 SUBMITTER: B. F. GOODRICH COMPANY
CAS NUMBER: 102-77-2 CHEMICAL NAME: MORPHOLINE, 4-(2-BENZOTHIAZOLYLTHIO)-
CAS NUMBER: 102-77-2 CHEMICAL NAME: OBTS
CAS NUMBER: 13752-51-7 CHEMICAL NAME: CURE-RITE 18
CAS NUMBER: 13752-51-7 CHEMICAL NAME: MORPHOLINE, 4-[(4-MORPHOLINYLTHIO)THIOXOMETHYL]-

8EHQ-0380-0335 S SUBMITTER: GULF OIL COMPANY - U.S.
CAS NUMBER: NONE CHEMICAL NAME: CUTTING FLUID
CAS NUMBER: NONE CHEMICAL NAME: GULFCUT HEAVY DUTY SOLUBLE OIL

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-0380-0335 S   (CONT.) SUBMITTER: GULF OIL COMPANY - U.S.
CAS NUMBER: NONE   CHEMICAL NAME: OIL, GULFCUT HEAVY DUTY SOLUBLE

8EHQ-0380-0336 S   SUBMITTER: HENKEL CORPORATION
CAS NUMBER: CONFIDENT   CHEMICAL NAME: STANAX 1166
CAS NUMBER: NONE   CHEMICAL NAME: POLYALKOXYLATED POLYAMINES
CAS NUMBER: 123-91-1   CHEMICAL NAME: 1,4-DIOXANE

8EHQ-0480-0337   SUBMITTER: PENNWALT CORPORATION
CAS NUMBER: 75-38-7   CHEMICAL NAME: ETHENE, 1,1-DIFLUORO-

8EHQ-0480-0338   SUBMITTER: LOCKHEED MISSILES & SPACE COMPANY, INC.
CAS NUMBER: NONE   CHEMICAL NAME: HX 999
CAS NUMBER: 80-08-0   CHEMICAL NAME: BENZENAMINE, 4,4'-SULFONYLBIS-
CAS NUMBER: 80-08-0   CHEMICAL NAME: DDS
CAS NUMBER: 80-08-0   CHEMICAL NAME: EPORAL
CAS NUMBER: 28768-32-3   CHEMICAL NAME: MY 720
CAS NUMBER: 28768-32-3   CHEMICAL NAME: OXIRANEMETHANAMINE, N,N'-(METHYLENEDI-4,1-PHENYLENE)BISIN-(OXIRANYLMETHYL)-

8EHQ-0480-0339   SUBMITTER: IBM CORPORATION
CAS NUMBER: NONE   CHEMICAL NAME: PHOTOCOPYING PRODUCTS/PROCESS
CAS NUMBER: 129-79-3   CHEMICAL NAME: 9H-FLUOREN-9-ONE, 2,4,7-TRINITRO-
CAS NUMBER: 129-79-3   CHEMICAL NAME: 2,4,7-TRINITROFLUORENONE

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

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8EHQ-0480-0340                SUBMITTER: CIBA-GEIGY CORPORATION
        CAS NUMBER:  UNKNOWN            CHEMICAL NAME: CHIMASSORB 944
        CAS NUMBER:  UNKNOWN            CHEMICAL NAME: POLY [N,N'-BIS(2,2,6,6-TETRAMETHYLPIPERID-4-YL)-N-(4-(1,1,3,
                                                       3-TETRAMETHYLBUTYLAMINO)-1,3,5-TRIAZINE-2,6-DIYL)HEXAMETHYLE
                                                       NEDIAMINE
8EHQ-0580-0341                SUBMITTER: UNION CARBIDE CORPORATION
        CAS NUMBER:  93-55-0            CHEMICAL NAME: 1-PROPANONE, 1-PHENYL-
8EHQ-0580-0342                SUBMITTER: ASARCO INCORPORATED
        CAS NUMBER:  1309-64-4          CHEMICAL NAME: ANTIMONY OXIDE
8EHQ-0580-0343                SUBMITTER: GULF OIL EXPLORATION AND PRODUCTION COMPANY
        CAS NUMBER:  7783-06-4          CHEMICAL NAME: HYDROGEN SULFIDE
8EHQ-0680-0344 P   *          SUBMITTER: WESTERN ELECTRIC
        CAS NUMBER:  NONE               CHEMICAL NAME: MISC. CHEMICALS
        CAS NUMBER:  NONE               CHEMICAL NAME: ZYTEL NYLON RESIN PURGING PROCESS
8EHQ-0680-0345                SUBMITTER: GLIDDEN COATINGS AND RESINS
        CAS NUMBER:  71-43-2            CHEMICAL NAME: BENZENE
        CAS NUMBER:  75-01-4            CHEMICAL NAME: ETHENE, CHLORO-
        CAS NUMBER:  75-01-4            CHEMICAL NAME: VINYL CHLORIDE
        CAS NUMBER:  75-09-2            CHEMICAL NAME: METHANE, DICHLORO-
        CAS NUMBER:  75-09-2            CHEMICAL NAME: METHYLENE CHLORIDE
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8EHQ-0680-0345 (CONT.) SUBMITTER: GLIDDEN COATINGS AND RESINS

CAS NUMBER: 75-34-3 CHEMICAL NAME: ETHANE, 1,1-DICHLORO-
CAS NUMBER: 75-71-8 CHEMICAL NAME: METHANE, DICHLORODIFLUORO-
CAS NUMBER: 79-01-6 CHEMICAL NAME: ETHENE, TRICHLORO-
CAS NUMBER: 79-01-6 CHEMICAL NAME: TRICHLOROETHYLENE
CAS NUMBER: 100-41-4 CHEMICAL NAME: BENZENE, ETHYL-
CAS NUMBER: 108-88-3 CHEMICAL NAME: BENZENE, METHYL-
CAS NUMBER: 108-88-3 CHEMICAL NAME: TOLUENE
CAS NUMBER: 127-18-4 CHEMICAL NAME: ETHENE, TETRACHLORO-
CAS NUMBER: 127-18-4 CHEMICAL NAME: TETRACHLOROETHYLENE
CAS NUMBER: 156-60-5 CHEMICAL NAME: ETHENE, 1,2-DICHLORO-, (E)-
CAS NUMBER: 7439-92-1 CHEMICAL NAME: LEAD
CAS NUMBER: 7439-97-6 CHEMICAL NAME: MERCURY
CAS NUMBER: 7440-02-0 CHEMICAL NAME: NICKEL
CAS NUMBER: 7440-22-4 CHEMICAL NAME: SILVER
CAS NUMBER: 7440-28-0 CHEMICAL NAME: THALLIUM
CAS NUMBER: 7440-36-0 CHEMICAL NAME: ANTIMONY
CAS NUMBER: 7440-38-2 CHEMICAL NAME: ARSENIC
CAS NUMBER: 7440-41-7 CHEMICAL NAME: BERYLLIUM
CAS NUMBER: 7440-43-9 CHEMICAL NAME: CADMIUM
CAS NUMBER: 7440-47-3 CHEMICAL NAME: CHROMIUM
CAS NUMBER: 7440-50-8 CHEMICAL NAME: COPPER

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

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8EHQ-0680-0345       (CONT.)  SUBMITTER: GLIDDEN COATINGS AND RESINS
          CAS NUMBER:  7440-66-6         CHEMICAL NAME: ZINC
          CAS NUMBER:  7782-49-2         CHEMICAL NAME: SELENIUM

8EHQ-0680-0346                SUBMITTER: ETHYL CORPORATION
          CAS NUMBER:  NONE              CHEMICAL NAME: ZINC DIALKYL DITHIOPHOSPHATES (ZDDP)
          CAS NUMBER:  2215-35-2         CHEMICAL NAME: 2-PENTANOL, 4-METHYL-, HYDROGEN PHOSPHORODITHIOATE, ZINC SAL
                                                        T
          CAS NUMBER:  68442-22-8        CHEMICAL NAME: PHOSPHORODITHIOIC ACID, MIXED 2-ETHYLHEXYL AND 2-METHYLPROPY
                                                        L ESTERS, ZINC SALTS

8EHQ-0680-0347                SUBMITTER: DOW CORNING CORPORATION
          CAS NUMBER:  2487-90-3         CHEMICAL NAME: SILANE, TRIMETHOXY-

8EHQ-0680-0348                SUBMITTER: AMCHEM PRODUCTS, INC.
          CAS NUMBER:  NONE              CHEMICAL NAME: RODINE 50
          CAS NUMBER:  NONE              CHEMICAL NAME: RODINE 500
          CAS NUMBER:  NONE              CHEMICAL NAME: RODINE 51
          CAS NUMBER:  NONE              CHEMICAL NAME: RODINE 85
          CAS NUMBER:  NONE              CHEMICAL NAME: RODINE 95
          CAS NUMBER:  NONE              CHEMICAL NAME: RODINE 96
          CAS NUMBER:  95-53-4           CHEMICAL NAME: BENZENAMINE, 2-METHYL-
          CAS NUMBER:  95-53-4           CHEMICAL NAME: TOLUIDINE (ORTHO)
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APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-0680-0349 SUBMITTER: UNION CARBIDE CORPORATION

CAS NUMBER: 67762-92-9 CHEMICAL NAME: SILICONE Y-6607

CAS NUMBER: 67762-92-9 CHEMICAL NAME: SILOXANES AND SILICONES, DI-ME, DIMETHYLAMINO-TERMINATED

8EHQ-0780-0350 SUBMITTER: PROCTER & GAMBLE COMPANY

CAS NUMBER: 4680-78-8 CHEMICAL NAME: C. I. ACID GREEN 3

CAS NUMBER: 4680-78-8 CHEMICAL NAME: BENZENEMETHANAMINIUM, N-ETHYL-N-[4-[[4-[ETHYL[(3-SULFOPHENYL)METHYL]AMINO]PHENYL]PHENYLMETHYLENE]-2,5-CYCLOHEXADIEN-1-YLIDENE]-3-SULFO-, HYDROXIDE, INNER SALT, SODIUM SALT

8EHQ-0780-0351 SUBMITTER: A. B. DICK COMPANY

CAS NUMBER: NONE CHEMICAL NAME: PHOTOCOPYING PRODUCTS/PROCESS

8EHQ-0780-0352 SUBMITTER: MONTGOMERY ELEVATOR COMPANY

CAS NUMBER: NONE CHEMICAL NAME: HYDRAULIC FLUIDS

CAS NUMBER: NONE CHEMICAL NAME: WYNN'S FRICTION PROOFING FLUID

CAS NUMBER: 1336-36-3 CHEMICAL NAME: 1,1'-BIPHENYL, CHLORINATED

CAS NUMBER: 1336-36-3 CHEMICAL NAME: POLYCHLORINATED BIPHENYLS (PCB)

8EHQ-0780-0353 SUBMITTER: STANDARD OIL COMPANY (SOHIO)

CAS NUMBER: 68187-58-6 CHEMICAL NAME: PITCH, PETROLEUM, CONDENSED-RING AROM.

8EHQ-0780-0354 SUBMITTER: MCB MANUFACTURING CHEMISTS, INC.

CAS NUMBER: 14808-60-7 CHEMICAL NAME: QUARTZ

CAS NUMBER: 63231-67-4 CHEMICAL NAME: SILICA GEL

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-0880-0355 SUBMITTER: ALLIED CHEMICAL CORPORATION
CAS NUMBER: 10533-67-2 CHEMICAL NAME: ACETALDEHYDE, (METHYLTHIO)-, OXIME

8EHQ-0880-0356 SUBMITTER: NALCO CHEMICAL COMPANY
CAS NUMBER: 818-61-1 CHEMICAL NAME: 2-PROPENOIC ACID, 2-HYDROXYETHYL ESTER

8EHQ-0880-0357 SUBMITTER: NALCO CHEMICAL COMPANY
CAS NUMBER: 110-26-9 CHEMICAL NAME: 2-PROPENAMIDE, N,N'-METHYLENEBIS-

8EHQ-0880-0358 * SUBMITTER: EMPLOYEE SUBMISSION
CAS NUMBER: NONE CHEMICAL NAME: RADIOACTIVE MATERIALS
CAS NUMBER: 7705-08-0 CHEMICAL NAME: IRON CHLORIDE

8EHQ-0980-0359 SUBMITTER: FMC CORPORATION
CAS NUMBER: UNKNOWN CHEMICAL NAME: 1,2-BENZENEDICARBOXYLIC ACID, 3,4,5,6-TETRABROMO-, DI-2-PROPENYL ESTER

8EHQ-0980-0360 SUBMITTER: HOOKER CHEMICALS AND PLASTICS CORPORATION
CAS NUMBER: 98-07-7 CHEMICAL NAME: BENZENE, (TRICHLOROMETHYL)-
CAS NUMBER: 98-88-4 CHEMICAL NAME: BENZOYL CHLORIDE
CAS NUMBER: 5216-25-1 CHEMICAL NAME: BENZENE, 1-CHLORO-4-(TRICHLOROMETHYL)-

8EHQ-0980-0361 S SUBMITTER: CONFIDENTIAL
CAS NUMBER: 14285-59-7 CHEMICAL NAME: COBALTATE(4-), [29H,31H-PHTHALOCYANINE-2,9,16,23-TETRASULFONATO(6-)-N29,N30,N31,N32]-, TETRAHYDROGEN, (SP-4-1)-
CAS NUMBER: 29383-29-7 CHEMICAL NAME: COBALTATE(2-), [29H,31H-PHTHALOCYANINEDISULFONATO(4-)-N29,N30,N31,N32]-, DIHYDROGEN

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-0980-0362 SUBMITTER: NALCO CHEMICAL COMPANY
CAS NUMBER: 57138-85-9 CHEMICAL NAME: BENZENAMINE, POLYMER WITH FORMALDEHYDE, HYDROCHLORIDE

8EHQ-0980-0363 SUBMITTER: INTERNATIONAL COAL REFINING COMPANY
CAS NUMBER: NONE CHEMICAL NAME: COAL, SOLVENT-REFINING (SRC) PROCESS/PRODUCTS
CAS NUMBER: NONE CHEMICAL NAME: SRC PROCESS/PRODUCTS
CAS NUMBER: 68410-08-2 CHEMICAL NAME: DISTILLATES (COAL), SOLVENT-REFINING (SRC), RECYCLE

8EHQ-0980-0364 SUBMITTER: EXXON CHEMICAL AMERICAS
CAS NUMBER: 77-73-6 CHEMICAL NAME: DICYCLOPENTADIENE
CAS NUMBER: 77-73-6 CHEMICAL NAME: 4,7-METHANO-1H-INDENE, 3A,4,7,7A-TETRAHYDRO-

8EHQ-0980-0365 SUBMITTER: S. C. JOHNSON & SON, INC.
CAS NUMBER: 71-55-6 CHEMICAL NAME: ETHANE, 1,1,1-TRICHLORO-

8EHQ-1080-0366 SUBMITTER: MOBIL RESEARCH AND DEVELOPMENT CORPORATION
CAS NUMBER: 868-85-9 CHEMICAL NAME: PHOSPHONIC ACID, DIMETHYL ESTER

8EHQ-1080-0367 SUBMITTER: OLIN CORPORATION
CAS NUMBER: 95-80-7 CHEMICAL NAME: 1,3-BENZENEDIAMINE, 4-METHYL-
CAS NUMBER: 121-14-2 CHEMICAL NAME: BENZENE, 1-METHYL-2,4-DINITRO-
CAS NUMBER: 823-40-5 CHEMICAL NAME: 1,3-BENZENEDIAMINE, 2-METHYL-
CAS NUMBER: 25321-14-6 CHEMICAL NAME: BENZENE, METHYLDINITRO-
CAS NUMBER: 25376-45-8 CHEMICAL NAME: BENZENEDIAMINE, AR-METHYL-

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-1080-0368 SUBMITTER: MARTIN MARIETTA CHEMICALS

CAS NUMBER: 86-28-2 CHEMICAL NAME: 9H-CARBAZOLE, 9-ETHYL-
CAS NUMBER: 95-50-1 CHEMICAL NAME: BENZENE, 1,2-DICHLORO-
CAS NUMBER: 100-41-4 CHEMICAL NAME: BENZENE, ETHYL-
CAS NUMBER: 106-42-3 CHEMICAL NAME: BENZENE, 1,4-DIMETHYL-
CAS NUMBER: 108-38-3 CHEMICAL NAME: BENZENE, 1,3-DIMETHYL-
CAS NUMBER: 108-88-3 CHEMICAL NAME: BENZENE, METHYL-
CAS NUMBER: 108-88-3 CHEMICAL NAME: TOLUENE
CAS NUMBER: 108-90-7 CHEMICAL NAME: BENZENE, CHLORO-

8EHQ-0780-0369 SUBMITTER: AMERICAN CYANAMID COMPANY

CAS NUMBER: 10310-38-0 CHEMICAL NAME: CYAGARD RF-1
CAS NUMBER: 10310-38-0 CHEMICAL NAME: PHOSPHONIUM, 1,2-ETHANEDIYLBIS[TRIS(2-CYANOETHYL)-, DIBROMIDE

8EHQ-1080-0370 SUBMITTER: EXXON CHEMICAL AMERICAS

CAS NUMBER: 106-99-0 CHEMICAL NAME: 1,3-BUTADIENE

8EHQ-1180-0371 SUBMITTER: LEVER BROTHERS COMPANY (INCORPORATED)

CAS NUMBER: NONE CHEMICAL NAME: VARISOFT 222 (90%)
CAS NUMBER: 67-63-0 CHEMICAL NAME: 2-PROPANOL
CAS NUMBER: 68153-35-5 CHEMICAL NAME: ETHANAMINIUM, 2-AMINO-N-(2-AMINOETHYL)-N-(2-HYDROXYETHYL)-N-METHYL-, N,N'-DITALLOW ACYL DERIVS., ME SULFATES (SALTS)

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-1180-0372 SUBMITTER: CALLERY CHEMICAL COMPANY

CAS NUMBER: 13292-87-0 CHEMICAL NAME: BORANE, COMPD. WITH THIOBIS[METHANE] (1:1)

8EHQ-1180-0373 S SUBMITTER: 3M COMPANY

CAS NUMBER: NONE CHEMICAL NAME: PERFLUOROALKYL COMPOUNDS

CAS NUMBER: 1691-99-2 CHEMICAL NAME: 1-OCTANESULFONAMIDE, N-ETHYL-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-HEPTADECAFLUORO-N-(2-HYDROXYETHYL)-

CAS NUMBER: 68555-73-7 CHEMICAL NAME: 1-HEPTANESULFONAMIDE, N-ETHYL-1,1,2,2,3,3,4,4,5,5,6,6,7,7,7-PENTADECAFLUORO-N-(2-HYDROXYETHYL)-

8EHQ-1180-0374 S SUBMITTER: 3M COMPANY

CAS NUMBER: CONFIDENT CHEMICAL NAME: PERFLUOROALKYL SULFONATES, POTASSIUM SALTS

CAS NUMBER: NONE CHEMICAL NAME: FLUORORAD FC-95

CAS NUMBER: NONE CHEMICAL NAME: PERFLUOROALKYL COMPOUNDS

8EHQ-1180-0375 S SUBMITTER: TENNECO CHEMICALS, INC.

CAS NUMBER: NONE CHEMICAL NAME: I-122

CAS NUMBER: UNKNOWN CHEMICAL NAME: CADMIUM SALTS OF P-TERT-BUTYL BENZOIC ACID AND BENZOIC ACID

8EHQ-1280-0376 SUBMITTER: STEPAN CHEMICAL COMPANY

CAS NUMBER: NONE CHEMICAL NAME: NITROSAMINES

CAS NUMBER: UNKNOWN CHEMICAL NAME: DODECANAMINE, N-METHYL-N-NITROSO-

CAS NUMBER: 62-75-9 CHEMICAL NAME: METHANAMINE, N-METHYL-N-NITROSO-

CAS NUMBER: 1643-20-5 CHEMICAL NAME: 1-DODECANAMINE, N,N-DIMETHYL-, N-OXIDE

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-0181-0377 SUBMITTER: ATLANTIC RICHFIELD COMPANY

CAS NUMBER: NONE CHEMICAL NAME: JET FUEL A

CAS NUMBER: UNKNOWN CHEMICAL NAME: OIL (PETROLEUM), NUMBER 6 HEAVY FUEL

8EHQ-0181-0378 SUBMITTER: INTERNATIONAL MINERALS & CHEMICAL CORPORATION

CAS NUMBER: 7446-09-5 CHEMICAL NAME: SULFUR DIOXIDE

8EHQ-0181-0379 SUBMITTER: EXXON CHEMICAL AMERICAS

CAS NUMBER: NONE CHEMICAL NAME: ZINC DIALKYL DITHIOPHOSPHATES (ZDDP)

CAS NUMBER: UNKNOWN CHEMICAL NAME: PHOSPHORODITHIOIC ACID, O,O'-DI(ISOHEXYL, ISOHEPTYL, ISOOCTYL, ISONONYL, ISODECYL)MIXED ESTERS, ZINC SALT

CAS NUMBER: UNKNOWN CHEMICAL NAME: PHOSPHORODITHIOIC ACID, (SECONDARY BUTYL AND ISOOCTYL)MIXED ESTERS, ZINC SALT

8EHQ-0181-0380 * SUBMITTER: R. T. VANDERBILT COMPANY, INC.

CAS NUMBER: 1072-71-5 CHEMICAL NAME: 1,3,4-THIADIAZOLIDINE-2,5-DITHIONE

8EHQ-0181-0381 SUBMITTER: PPG INDUSTRIES, INC.

CAS NUMBER: 107-18-6 CHEMICAL NAME: 2-PROPEN-1-OL

CAS NUMBER: 15022-08-9 CHEMICAL NAME: CARBONIC ACID, DI-2-PROPENYL ESTER

8EHQ-0281-0382 SUBMITTER: GLYCO CHEMICALS, INC.

CAS NUMBER: 77-48-5 CHEMICAL NAME: 2,4-IMIDAZOLIDINEDIONE, 1,3-DIBROMO-5,5-DIMETHYL-

CAS NUMBER: 118-52-5 CHEMICAL NAME: 2,4-IMIDAZOLIDINEDIONE, 1,3-DICHLORO-5,5-DIMETHYL-

CAS NUMBER: 126-06-7 CHEMICAL NAME: 2,4-IMIDAZOLIDINEDIONE, 3-BROMO-1-CHLORO-5,5-DIMETHYL-

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-0281-0383 S   *   SUBMITTER: CONFIDENTIAL
CAS NUMBER: NONE   CHEMICAL NAME: BENZOFURAZANS, NITRO-
CAS NUMBER: NONE   CHEMICAL NAME: BENZOFUROXANS, NITRO-
CAS NUMBER: 10199-89-0   CHEMICAL NAME: BENZOFURAZAN, 4-CHLORO-7-NITRO-

8EHQ-0281-0384   SUBMITTER: DOW CHEMICAL COMPANY
CAS NUMBER: 109-86-4   CHEMICAL NAME: ETHANOL, 2-METHOXY-

8EHQ-0281-0385   SUBMITTER: GULF OIL COMPANY - U.S.
CAS NUMBER: NONE   CHEMICAL NAME: GULF SUPERQUENCH 70
CAS NUMBER: 64742-04-7   CHEMICAL NAME: EXTRACTS (PETROLEUM), HEAVY PARAFFINIC DISTILLATE SOLVENT
CAS NUMBER: 64742-04-7   CHEMICAL NAME: GULF N.E. 75 (PROCESS 63)
CAS NUMBER: 64742-11-6   CHEMICAL NAME: EXTRACTS (PETROLEUM), HEAVY NAPHTHENIC DISTILLATE SOLVENT
CAS NUMBER: 64742-11-6   CHEMICAL NAME: GULF N.E. 61 (PROCESS 65)
CAS NUMBER: 64742-16-1   CHEMICAL NAME: PETROLEUM RESINS
CAS NUMBER: 64742-52-5   CHEMICAL NAME: DISTILLATES (PETROLEUM), HYDROTREATED HEAVY NAPHTHENIC
CAS NUMBER: 64742-52-5   CHEMICAL NAME: GULF 100 TEXAS OIL
CAS NUMBER: 64742-55-8   CHEMICAL NAME: DISTILLATES (PETROLEUM), HYDROTREATED LIGHT PARAFFINIC

8EHQ-0381-0386   SUBMITTER: SHELL OIL COMPANY
CAS NUMBER: NONE   CHEMICAL NAME: MISC. CHEMICALS
CAS NUMBER: 110-80-5   CHEMICAL NAME: ETHANOL, 2-ETHOXY-

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-0381-0387 SUBMITTER: ETHYL CORPORATION
CAS NUMBER: 2524-03-0 CHEMICAL NAME: PHOSPHOROCHLORIDOTHIOIC ACID, O,O-DIMETHYL ESTER

8EHQ-0381-0388 S SUBMITTER: EXXON CHEMICAL AMERICAS
CAS NUMBER: CONFIDENT CHEMICAL NAME: PHENOL SULFIDE, ALKYLATED-, CALCIUM SALT
CAS NUMBER: NONE CHEMICAL NAME: PARANOX 52

8EHQ-0381-0389 SUBMITTER: SHELL OIL COMPANY
CAS NUMBER: NONE CHEMICAL NAME: OIL (PETROLEUM), NEW MOTOR
CAS NUMBER: NONE CHEMICAL NAME: OIL (PETROLEUM), USED MOTOR
CAS NUMBER: NONE CHEMICAL NAME: POLYNUCLEAR AROMATIC HYDROCARBONS

8EHQ-0381-0390 SUBMITTER: DOW CHEMICAL COMPANY
CAS NUMBER: NONE CHEMICAL NAME: DIOXINS, CHLORINATED
CAS NUMBER: 1746-01-6 CHEMICAL NAME: DIOXIN, 2,3,7,8-TETRACHLORODIBENZO-P-
CAS NUMBER: 25167-82-2 CHEMICAL NAME: PHENOL, TRICHLORO-

8EHQ-0381-0391 SUBMITTER: BUCKMAN LABORATORIES, INC.
CAS NUMBER: 68479-77-6 CHEMICAL NAME: BL-4420
CAS NUMBER: 68479-77-6 CHEMICAL NAME: PROPANOIC ACID, 2,3-DIBROMO-, 2-HYDROXYETHYL ESTER

8EHQ-0381-0392 SUBMITTER: UNION CARBIDE CORPORATION
CAS NUMBER: 624-83-9 CHEMICAL NAME: METHANE, ISOCYANATO-

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

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8EHQ-0381-0393              SUBMITTER: DOW CHEMICAL COMPANY
        CAS NUMBER:  NONE             CHEMICAL NAME: CYCLOHEXANES, HEXAHALOGENATED-
        CAS NUMBER:  NONE             CHEMICAL NAME: FR651
        CAS NUMBER:  87-84-3          CHEMICAL NAME: CYCLOHEXANE, 1,2,3,4,5-PENTABROMO-6-CHLORO-

8EHQ-0381-0394 S            SUBMITTER: 3M COMPANY
        CAS NUMBER:  CONFIDENT        CHEMICAL NAME: PERFLUOROALKYL CARBOXYLIC ACID, AMMONIUM SALTS
        CAS NUMBER:  CONFIDENT        CHEMICAL NAME: PERFLUOROALKYL CARBOXYLIC ACIDS
        CAS NUMBER:  NONE             CHEMICAL NAME: FLUORORAD FC-143
        CAS NUMBER:  NONE             CHEMICAL NAME: PERFLUOROALKYL COMPOUNDS

8EHQ-0481-0396     *        SUBMITTER: MARTIN MARIETTA CHEMICALS
        CAS NUMBER:  UNKNOWN          CHEMICAL NAME: DISPERSE BLUE 291
        CAS NUMBER:  UNKNOWN          CHEMICAL NAME: EASTMAN BLUE RBS
        CAS NUMBER:  UNKNOWN          CHEMICAL NAME: SODYECRON BLUE GBL

8EHQ-0481-0397              SUBMITTER: WILMINGTON CHEMICAL CORPORATION
        CAS NUMBER:  NONE             CHEMICAL NAME: EPOXY RESINS
        CAS NUMBER:  NONE             CHEMICAL NAME: HELOXY WC-68
        CAS NUMBER:  NONE             CHEMICAL NAME: MISC. CHEMICALS
        CAS NUMBER:  NONE             CHEMICAL NAME: XB 2793
        CAS NUMBER:  15336-81-9       CHEMICAL NAME: 2,4-IMIDAZOLIDINEDIONE, 5,5-DIMETHYL-1,3-BIS(OXIRANYLMETHYL)
                                                     -
        CAS NUMBER:  17557-23-2       CHEMICAL NAME: OXIRANE, 2,2'-[(2,2-DIMETHYL-1,3-PROPANEDIYL)BIS(OXYMETHYLEN
                                                     E)]BIS-
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APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-0581-0398 SUBMITTER: GULF MINERAL RESOURCES CO.

CAS NUMBER: NONE CHEMICAL NAME: COAL, SOLVENT-REFINING (SRC) PROCESS/PRODUCTS

CAS NUMBER: NONE CHEMICAL NAME: SRC PROCESS/PRODUCTS

CAS NUMBER: UNKNOWN CHEMICAL NAME: DISTILLATES (COAL), SOLVENT-REFINING (SRC), MIDDLE

8EHQ-0581-0399 S SUBMITTER: HERCULES INCORPORATED

CAS NUMBER: NONE CHEMICAL NAME: HIGH EXPLOSIVE (MIXTURE)

8EHQ-0581-0400 SUBMITTER: UPJOHN COMPANY

CAS NUMBER: 6175-45-7 CHEMICAL NAMF: ETHANONE, 2,2-DIETHOXY-1-PHENYL-

CAS NUMBER: 6175-45-7 CHEMICAL NAME: U-2352

8EHQ-1280-0401 S SUBMITTER: STAUFFER CHEMICAL COMPANY

CAS NUMBER: 13674-87-8 CHEMICAL NAME: FYROL FR-2

CAS NUMBER: 13674-87-8 CHEMICAL NAME: 2-PROPANOL, 1,3-DICHLORO-, PHOSPHATE (3:1)

8EHQ-0681-0402 SUBMITTER: UNION CARBIDE CORPORATION

CAS NUMBER: 3388-04-3 CHEMICAL NAME: SILANE A-186

CAS NUMBER: 3388-04-3 CHEMICAL NAME: SILANE, TRIMETHOXY[2-(7-OXABICYCLO[4.1.0]HEPT-3-YL)ETHYL]-

8EHQ-0681-0403 S SUBMITTER: CONFIDENTIAL

CAS NUMBER: 29383-29-7 CHEMICAL NAME: COBALTATE(2-), [29H,31H-PHTHALOCYANINEDISULFONATO(4-)-N29,N30,N31,N32]-, DIHYDROGEN

CAS NUMBER: 30638-08-5 CHEMICAL NAME: COBALTATE(1-), [29H,31H-PHTHALOCYANINESULFONATO(3-)-N29,N30,N31,N32]-, HYDROGEN

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                         APPENDIX E:  STATUS REPORTS BY SUBMISSION NUMBER (CONT.)
8EHQ-0681-0404           SUBMITTER: GULF OIL COMPANY - U.S.
      CAS NUMBER:  64742-55-8       CHEMICAL NAME: DISTILLATES (PETROLEUM), HYDROTREATED LIGHT PARAFFINIC
      CAS NUMBER:  64742-55-8       CHEMICAL NAME: GULF PARALUX 70

8EHQ-0781-0405 S         SUBMITTER: CONFIDENTIAL
      CAS NUMBER:  CONFIDENT        CHEMICAL NAME: PHOSPHORODITHIOIC ACID, DIALKYL ESTERS, ZINC SALT
      CAS NUMBER:  NONE             CHEMICAL NAME: ZINC DIALKYL DITHIOPHOSPHATES (ZDDP)

8EHQ-0781-0406 S         SUBMITTER: CELANESE CORPORATION
      CAS NUMBER:  25038-04-4       CHEMICAL NAME: 1,2,3-PROPANETRIOL, POLYMER WITH (CHLOROMETHYL)OXIRANE

8EHQ-0881-0407           SUBMITTER: E. I. DUPONT DE NEMOURS & COMPANY, INC.
      CAS NUMBER:  7789-21-1        CHEMICAL NAME: FLUOROSULFURIC ACID

8EHQ-0881-0408 S   *     SUBMITTER: CONFIDENTIAL
      CAS NUMBER:  UNKNOWN          CHEMICAL NAME: STEARYLPHENYLETHYLDIMETHYL AMMONIUM P-TOLUENE SULFONATE

8EHQ-0981-0409           SUBMITTER: VELSICOL CHEMICAL CORPORATION
      CAS NUMBER:  NONE             CHEMICAL NAME: DIBENZOFURANS, CHLORINATED
      CAS NUMBER:  NONE             CHEMICAL NAME: DIOXINS, CHLORINATED
      CAS NUMBER:  NONE             CHEMICAL NAME: MISC. CHEMICALS
      CAS NUMBER:  95-76-1          CHEMICAL NAME: BENZENAMINE, 3,4-DICHLORO-
      CAS NUMBER:  330-54-1         CHEMICAL NAME: DIURON
      CAS NUMBER:  330-54-1         CHEMICAL NAME: UREA, N'-(3,4-DICHLOROPHENYL)-N,N-DIMETHYL-
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                         APPENDIX E:  STATUS REPORTS BY SUBMISSION NUMBER (CONT.)
8EHQ-0981-0409       (CONT.)  SUBMITTER: VELSICOL CHEMICAL CORPORATION
          CAS NUMBER:  330-55-2          CHEMICAL NAME: LINURON
          CAS NUMBER:  330-55-2          CHEMICAL NAME: UREA, N'-(3,4-DICHLOROPHENYL)-N-METHOXY-N-METHYL-
          CAS NUMBER:  709-98-8          CHEMICAL NAME: PROPANIL
          CAS NUMBER:  709-98-8          CHEMICAL NAME: PROPIONAMIDE, N-(3,4-DICHLOROPHENYL)-
          CAS NUMBER:  14047-09-7        CHEMICAL NAME: BENZENE, 3,3',4,4'-TETRACHLOROAZO-
          CAS NUMBER:  20354-26-1        CHEMICAL NAME: METHAZOLE (TECHNICAL)
          CAS NUMBER:  20354-26-1        CHEMICAL NAME: 1,2,4-OXADIAZOLIDINE-3,5-DIONE,
          CAS NUMBER:  21232-47-3        CHEMICAL NAME: BENZENE, 3,3',4,4'-TETRACHLOROAZOXY-

8EHQ-0981-0410                SUBMITTER: CELANESE CORPORATION
          CAS NUMBER:  1680-21-3         CHEMICAL NAME: 2-PROPENOIC ACID, 1,2-ETHANEDIYLBIS(OXY-2,1-ETHANEDIYL) ESTE
                                                        R

8EHQ-0981-0411                SUBMITTER: CELANESE CORPORATION
          CAS NUMBER:  17831-71-9        CHEMICAL NAME: 2-PROPENOIC ACID, OXYBIS(2,1-ETHANEDIYLOXY-2,1-ETHANEDIYL) E
                                                        STER

8EHQ-0981-0412                SUBMITTER: ETHYL CORPORATION
          CAS NUMBER:  993-43-1          CHEMICAL NAME: PHOSPHONOTHIOIC DICHLORIDE, ETHYL-

8EHQ-0981-0413                SUBMITTER: ARMAK COMPANY
          CAS NUMBER:  UNKNOWN           CHEMICAL NAME: 1,1'-BIPHENYL, 2,2',4,4'-TETRACHLORO-
          CAS NUMBER:  1336-36-3         CHEMICAL NAME: 1,1'-BIPHENYL, CHLORINATED
          CAS NUMBER:  1336-36-3         CHEMICAL NAME: POLYCHLORINATED BIPHENYLS (PCB)
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APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-1081-0414 SUBMITTER: WITCO CHEMICAL CORPORATION
CAS NUMBER: NONE CHEMICAL NAME: HYBASE M-400
CAS NUMBER: 61789-87-5 CHEMICAL NAME: SULFONIC ACIDS, PETROLEUM, MAGNESIUM SALTS

8EHQ-1081-0415 SUBMITTER: ATLANTIC RICHFIELD COMPANY
CAS NUMBER: 75-91-2 CHEMICAL NAME: HYDROPEROXIDE, 1,1-DIMETHYLETHYL

8EHQ-1081-0416 SUBMITTER: GREAT LAKES CHEMICAL CORPORATION
CAS NUMBER: 76-06-2 CHEMICAL NAME: METHANE, TRICHLORONITRO-

8EHQ-1081-0417 SUBMITTER: UNION OIL COMPANY OF CALIFORNIA
CAS NUMBER: NONE CHEMICAL NAME: OIL (SHALE), FULL-RANGE DEWAXED SYNCRUDE
CAS NUMBER: NONE CHEMICAL NAME: OIL (SHALE), REDUCED SYNCRUDE
CAS NUMBER: 68308-34-9 CHEMICAL NAME: SHALE OILS

8EHQ-1081-0418 SUBMITTER: CIBA-GEIGY CORPORATION
CAS NUMBER: 15336-82-0 CHEMICAL NAME: 2,4-IMIDAZOLIDINEDIONE, 5-ETHYL-5-METHYL-1,3-BIS(OXIRANYLMETHYL)-
CAS NUMBER: 15336-82-0 CHEMICAL NAME: XU-238

8EHQ-1081-0419 SUBMITTER: EXXON CHEMICAL AMERICAS
CAS NUMBER: 26472-00-4 CHEMICAL NAME: 4,7-METHANO-1H-INDENE, 3A,4,7,7A-TETRAHYDRODIMETHYL-
CAS NUMBER: 26472-00-4 CHEMICAL NAME: METHYLCYCLOPENTADIENE DIMER

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-1281-0420 SUBMITTER: EXXON CHEMICAL AMERICAS

CAS NUMBER: UNKNOWN CHEMICAL NAME: PROPANE, DIBROMOCHLOROMETHYL-

CAS NUMBER: 68441-14-5 CHEMICAL NAME: BROMOBUTYL 2244

CAS NUMBER: 68441-14-5 CHEMICAL NAME: 1,3-BUTADIENE, 2-METHYL-, POLYMER WITH 2-METHYL-1-PROPENE, BROMINATED

CAS NUMBER: 68441-14-5 CHEMICAL NAME: RUBBER, BROMINATED BUTYL-

8EHQ-1281-0421 S SUBMITTER: CONFIDENTIAL

CAS NUMBER: 98-51-1 CHEMICAL NAME: BENZENE, 1-(1,1-DIMETHYLETHYL)-4-METHYL-

CAS NUMBER: 98-51-1 CHEMICAL NAME: TOLUENE, P-TERT-BUTYL-

CAS NUMBER: 939-97-9 CHEMICAL NAME: BENZALDEHYDE, P-TERT-BUTYL-

CAS NUMBER: 939-97-9 CHEMICAL NAME: BENZALDEHYDE, 4-(1,1-DIMETHYLETHYL)-

8EHQ-1281-0422 SUBMITTER: ATLANTIC RICHFIELD COMPANY

CAS NUMBER: 8006-61-9 CHEMICAL NAME: GASOLINE, NATURAL

CAS NUMBER: 8006-61-9 CHEMICAL NAME: GASOLINE, UNLEADED

8EHQ-1281-0423 SUBMITTER: UNION CARBIDE CORPORATION

CAS NUMBER: UNKNOWN CHEMICAL NAME: CARBON (FIBERS)

CAS NUMBER: UNKNOWN CHEMICAL NAME: THORNEL MAT

CAS NUMBER: UNKNOWN CHEMICAL NAME: THORNEL TYPE P (HIGH MODULUS)

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-1281-0424 SUBMITTER: VELSICOL CHEMICAL CORPORATION

CAS NUMBER: 14047-09-7 CHEMICAL NAME: BENZENE, 3,3',4,4'-TETRACHLOROAZO-

CAS NUMBER: 21232-47-3 CHEMICAL NAME: BENZENE, 3,3',4,4'-TETRACHLOROAZOXY-

8EHQ-1281-0425 S SUBMITTER: CONFIDENTIAL

CAS NUMBER: CONFIDENT CHEMICAL NAME: PHOSPHORODITHIOIC ACID, O,O'-DIALKYL ESTER, ANTIMONY SALT

8EHQ-1281-0426 SUBMITTER: CIBA-GEIGY CORPORATION

CAS NUMBER: 5026-74-4 CHEMICAL NAME: OXIRANEMETHANAMINE, N-[4-(OXIRANYLMETHOXY)PHENYL]-N-(OXIRANYLMETHYL)-

8EHQ-0282-0427 S SUBMITTER: CONFIDENTIAL

CAS NUMBER: UNKNOWN CHEMICAL NAME: V-50 DECOMPOSITION PRODUCT

CAS NUMBER: 2997-92-4 CHEMICAL NAME: PROPANIMIDAMIDE, 2,2'-AZOBIS[2-METHYL-, DIHYDROCHLORIDE

CAS NUMBER: 2997-92-4 CHEMICAL NAME: V-50

8EHQ-0282-0428 * SUBMITTER: BUFFALO COLOR CORPORATION

CAS NUMBER: 121-69-7 CHEMICAL NAME: BENZENAMINE, N,N-DIMETHYL-

8EHQ-0282-0429 * SUBMITTER: BUFFALO COLOR CORPORATION

CAS NUMBER: 103-69-5 CHEMICAL NAME: BENZENAMINE, N-ETHYL-

8EHQ-0282-0430 * SUBMITTER: BUFFALO COLOR CORPORATION

CAS NUMBER: 91-66-7 CHEMICAL NAME: BENZENAMINE, N,N-DIETHYL-

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-0282-0431 * SUBMITTER: BUFFALO COLOR CORPORATION
CAS NUMBER: 25134-21-8 CHEMICAL NAME: 4,7-METHANOISOBENZOFURAN-1,3-DIONE, 3A,4,7,7A-TETRAHYDROMETHYL-
CAS NUMBER: 25134-21-8 CHEMICAL NAME: NADIC METHYL ANHYDRIDE

8EHQ-0282-0432 * SUBMITTER: BUFFALO COLOR CORPORATION
CAS NUMBER: 25377-73-5 CHEMICAL NAME: 2,5-FURANDIONE, 3-(DODECENYL)DIHYDRO-

8EHQ-0282-0433 * SUBMITTER: BUFFALO COLOR CORPORATION
CAS NUMBER: 108-30-5 CHEMICAL NAME: 2,5-FURANDIONE, DIHYDRO-

8EHQ-0282-0434 SUBMITTER: SUN CHEMICAL CORPORATION
CAS NUMBER: 81-88-9 CHEMICAL NAME: C. I. BASIC VIOLET 10
CAS NUMBER: 81-88-9 CHEMICAL NAME: ETHANAMINIUM, N-[9-(2-CARBOXYPHENYL)-6-(DIETHYLAMINO)-3H-XANTHEN-3-YLIDENE]-N-ETHYL-, CHLORIDE
CAS NUMBER: 81-88-9 CHEMICAL NAME: D&C RED NO. 19
CAS NUMBER: 81-88-9 CHEMICAL NAME: RHODAMINE B

8EHQ-0282-0435 SUBMITTER: FMC CORPORATION
CAS NUMBER: 1313-82-2 CHEMICAL NAME: SODIUM SULFIDE

8EHQ-0282-0436 * SUBMITTER: BUFFALO COLOR CORPORATION
CAS NUMBER: 8004-87-3 CHEMICAL NAME: C. I. BASIC VIOLET 1

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

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8EHQ-0282-0437                SUBMITTER: LEVER BROTHERS COMPANY (INCORPORATED)
         CAS NUMBER:  6227-14-1          CHEMICAL NAME: C. I. DIRECT VIOLET 9
         CAS NUMBER:  6227-14-1          CHEMICAL NAME: 2-NAPHTHALENESULFONIC ACID, 4-HYDROXY-3-[[2-METHOXY-5-METHYL
                                                        -4-[(4-SULFOPHENYL)AZO]PHENYL]AZO]-7-(PHENYLAMINO)-, DISODIU
                                                        M SALT
8EHQ-0382-0438 S              SUBMITTER: CONFIDENTIAL
         CAS NUMBER:  UNKNOWN            CHEMICAL NAME: ACRYLIC ACID-STARCH GRAFT, PARTIAL SODIUM SALT
         CAS NUMBER:  UNKNOWN            CHEMICAL NAME: POLYACRYLIC ACID, PARTIAL ALUMINUM POTASSIUM SALT
         CAS NUMBER:  UNKNOWN            CHEMICAL NAME: POLYACRYLIC ACID, PARTIAL SODIUM SALT
         CAS NUMBER:  9003-01-4          CHEMICAL NAME: POLYACRYLIC ACID
         CAS NUMBER:  9003-01-4          CHEMICAL NAME: 2-PROPENOIC ACID, HOMOPOLYMER
8EHQ-0282-0439                SUBMITTER: DOW CHEMICAL COMPANY
         CAS NUMBER:  75-56-9            CHEMICAL NAME: OXIRANE, METHYL-
         CAS NUMBER:  75-56-9            CHEMICAL NAME: PROPYLENE OXIDE
8EHQ-0382-0440 S              SUBMITTER: SHELL OIL COMPANY
         CAS NUMBER:  98-73-7            CHEMICAL NAME: BENZOIC ACID, P-TERT-BUTYL-
         CAS NUMBER:  98-73-7            CHEMICAL NAME: BENZOIC ACID, 4-(1,1-DIMETHYLETHYL)-
8EHQ-0382-0441                SUBMITTER: DOW CHEMICAL COMPANY
         CAS NUMBER:  106-99-0           CHEMICAL NAME: 1,3-BUTADIENE
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APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-0482-0442 SUBMITTER: STEPAN CHEMICAL COMPANY

CAS NUMBER: NONE CHEMICAL NAME: STEPAN AGENT 291-83
CAS NUMBER: 77-78-1 CHEMICAL NAME: SULFURIC ACID, DIMETHYL ESTER
CAS NUMBER: 3076-26-4 CHEMICAL NAME: OCTADECANOIC ACID, 2-SULFO-, 1-METHYL ESTER
CAS NUMBER: 29454-23-7 CHEMICAL NAME: TETRADECANOIC ACID, 2-SULFO-, 1-METHYL ESTER
CAS NUMBER: 58849-75-5 CHEMICAL NAME: HEXADECANOIC ACID, 2-SULFO-, 1-METHYL ESTER

8EHQ-0482-0443 SUBMITTER: CIBA-GEIGY CORPORATION

CAS NUMBER: 30947-30-9 CHEMICAL NAME: IRGASTAB 2002
CAS NUMBER: 30947-30-9 CHEMICAL NAME: PHOSPHONIC ACID, [[3,5-BIS(1,1-DIMETHYLETHYL)-4-HYDROXYPHENYL]METHYL]-, MONOETHYL ESTER, NICKEL(2+) SALT (2:1)

8EHQ-0582-0444 SUBMITTER: VELSICOL CHEMICAL CORPORATION

CAS NUMBER: 98-07-7 CHEMICAL NAME: BENZENE, (TRICHLOROMETHYL)-
CAS NUMBER: 98-87-3 CHEMICAL NAME: BENZENE, (DICHLOROMETHYL)-
CAS NUMBER: 98-88-4 CHEMICAL NAME: BENZOYL CHLORIDE
CAS NUMBER: 100-44-7 CHEMICAL NAME: BENZENE, (CHLOROMETHYL)-

8EHQ-0582-0445 SUBMITTER: SHERWIN-WILLIAMS COMPANY

CAS NUMBER: UNKNOWN CHEMICAL NAME: THIOXANTHEN-9-ONE, 2-DODECYL-9-H-

8EHQ-0682-0446 S SUBMITTER: STANDARD OIL COMPANY (INDIANA)

CAS NUMBER: 64741-46-4 CHEMICAL NAME: NAPHTHA (PETROLEUM), LIGHT STRAIGHT-RUN
CAS NUMBER: 64741-55-5 CHEMICAL NAME: NAPHTHA (PETROLEUM), LIGHT CATALYTIC CRACKED

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-0682-0446 S (CONT.) SUBMITTER: STANDARD OIL COMPANY (INDIANA)
CAS NUMBER: 64741-64-6 CHEMICAL NAME: NAPHTHA (PETROLEUM), FULL-RANGE ALKYLATE

8EHQ-0682-0447 SUBMITTER: SUN REFINING AND MARKETING COMPANY
CAS NUMBER: 64741-52-2 CHEMICAL NAME: DISTILLATES (PETROLEUM), LIGHT NAPHTHENIC

8EHQ-0682-0448 S SUBMITTER: GAF CORPORATION
CAS NUMBER: 3445-11-2 CHEMICAL NAME: 2-PYRROLIDINONE, 1-(2-HYDROXYETHYL)-

8EHQ-0682-0449 S SUBMITTER: BUCKMAN LABORATORIES, INC.
CAS NUMBER: 111-44-4 CHEMICAL NAME: ETHANE, 1,1'-OXYBIS[2-CHLORO-
CAS NUMBER: 123-91-1 CHEMICAL NAME: 1,4-DIOXANE

8EHQ-0682-0450 SJBMITTER: TENNESSEE EASTMAN COMPANY
CAS NUMBER: 111-15-9 CHEMICAL NAME: ETHANOL, 2-ETHOXY-, ACETATE

8EHQ-0682-0451 SUBMITTER: BORG-WARNER CHEMICALS, INC.
CAS NUMBER: 101-02-0 CHEMICAL NAME: PHOSPHOROUS ACID, TRIPHENYL ESTER

8EHQ-0882-0452 SUBMITTER: EASTMAN KODAK COMPANY
CAS NUMBER: 635-22-3 CHEMICAL NAME: BENZENAMINE, 4-CHLORO-3-NITRO-

8EHQ-0882-0453 SUBMITTER: UNION CARBIDE CORPORATION
CAS NUMBER: 75-21-8 CHEMICAL NAME: ETHYLENE OXIDE
CAS NUMBER: 75-21-8 CHEMICAL NAME: OXIRANE

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                          APPENDIX E:  STATUS REPORTS BY SUBMISSION NUMBER (CONT.)
8EHQ-0882-0454                 SUBMITTER: CELANESE CORPORATION
      CAS NUMBER:  3524-68-3         CHEMICAL NAME: 2-PROPENOIC ACID, 2-(HYDROXYMETHYL)-2-[[(1-OXO-2-PROPENYL)OX
                                                    Y]METHYL]-1,3-PROPANEDIYL ESTER
      CAS NUMBER:  4986-89-4         CHEMICAL NAME: 2-PROPENOIC ACID, 2,2-BIS[[(1-OXO-2-PROPENYL)OXY]METHYL]-1,3
                                                    -PROPANEDIYL ESTER
      CAS NUMBER:  53417-29-1        CHEMICAL NAME: PENTAERYTHRITOL DIACRYLATE
8EHQ-0982-0455                 SUBMITTER: CELANESE CORPORATION
      CAS NUMBER:  2481-94-9         CHEMICAL NAME: BENZENAMINE, N,N-DIETHYL-4-(PHENYLAZO)-
      CAS NUMBER:  2481-94-9         CHEMICAL NAME: OIL YELLOW E190
      CAS NUMBER:  2481-94-9         CHEMICAL NAME: C. I. SOLVENT YELLOW 56
      CAS NUMBER:  6368-72-5         CHEMICAL NAME: 2-NAPHTHALENAMINE, N-ETHYL-1-[[4-(PHENYLAZO)PHENYL]AZO]-
      CAS NUMBER:  6368-72-5         CHEMICAL NAME: C. I. SOLVENT RED 19
8EHQ-0982-0456 S   *           SUBMITTER: GULF REFINING AND MARKETING COMPANY
      CAS NUMBER:  NONE              CHEMICAL NAME: GULF TS-905-HWCF
8EHQ-0982-0457                 SUBMITTER: GENERAL ELECTRIC COMPANY
      CAS NUMBER:  71-55-6           CHEMICAL NAME: ETHANE, 1,1,1-TRICHLORO-
      CAS NUMBER:  75-01-4           CHEMICAL NAME: ETHENE, CHLORO-
      CAS NUMBER:  75-01-4           CHEMICAL NAME: VINYL CHLORIDE
      CAS NUMBER:  79-01-6           CHEMICAL NAME: ETHENE, TRICHLORO-
      CAS NUMBER:  79-01-6           CHEMICAL NAME: TRICHLOROETHYLENE
      CAS NUMBER:  117-81-7          CHEMICAL NAME: 1,2-BENZENEDICARBOXYLIC ACID, BIS(2-ETHYLHEXYL) ESTER
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APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-0982-0457 (CONT.) SUBMITTER: GENERAL ELECTRIC COMPANY

CAS NUMBER: 156-60-5 CHEMICAL NAME: ETHENE, 1,2-DICHLORO-, (E)-

CAS NUMBER: 1336-36-3 CHEMICAL NAME: 1,1'-BIPHENYL, CHLORINATED

CAS NUMBER: 1336-36-3 CHEMICAL NAME: POLYCHLORINATED BIPHENYLS (PCB)

CAS NUMBER: 12002-48-1 CHEMICAL NAME: BENZENE, TRICHLORO-

8EHQ-0982-0458 SUBMITTER: GREAT LAKES CHEMICAL CORPORATION

CAS NUMBER: 21850-44-2 CHEMICAL NAME: BENZENE, 1,1'-(1-METHYLETHYLIDENE)BIS[3,5-DIBROMO-4-(2,3-DIBROMOPROPOXY)-

8EHQ-1082-0459 SUBMITTER: ATLANTIC RICHFIELD COMPANY

CAS NUMBER: 57472-68-1 CHEMICAL NAME: 2-PROPENOIC ACID, OXYBIS(METHYL-2,1-ETHANEDIYL) ESTER

8EHQ-1082-0460 SUBMITTER: ATLANTIC RICHFIELD COMPANY

CAS NUMBER: UNKNOWN CHEMICAL NAME: 9-OCTADECENOIC ACID, (Z)-, 3-[(1-OXO-2-PROPENYL)OXY]-2,2-BIS[[(1-OXO-2-PROPENYL)OXY]METHYL]PROPYL ESTER

CAS NUMBER: UNKNOWN CHEMICAL NAME: PENTAERYTHRITOL MONOOLEATE TRIACRYLATE

8EHQ-1082-0461 SUBMITTER: AIR PRODUCTS AND CHEMICALS, INC.

CAS NUMBER: UNKNOWN CHEMICAL NAME: BENZENEDIAMINE(S), CHLORINATED, AR-METHYL-

8EHQ-1182-0462 SUBMITTER: EASTMAN KODAK COMPANY

CAS NUMBER: 619-80-7 CHEMICAL NAME: BENZAMIDE, 4-NITRO-

APPENDIX E: STATUS REPORTS BY SUBMISSION NUMBER (CONT.)

8EHQ-1182-0463 SUBMITTER: DIAMOND SHAMROCK CORPORATION

CAS NUMBER: 10588-01-9 CHEMICAL NAME: CHROMIC ACID, DISODIUM SALT

CAS NUMBER: 13765-19-0 CHEMICAL NAME: CHROMIC ACID, CALCIUM SALT (1:1)

8EHQ-1182-0464 SUBMITTER: VULCAN CHEMICALS

CAS NUMBER: 74-87-3 CHEMICAL NAME: METHANE, CHLORO-

8EHQ-1182-0465 SUBMITTER: CELANESE CORPORATION

CAS NUMBER: NONE CHEMICAL NAME: CALCO OIL BRONZE Y

CAS NUMBER: NONE CHEMICAL NAME: CALCO OIL RED YM

8EHQ-1182-0466 * SUBMITTER: E. I. DUPONT DE NEMOURS & COMPANY, INC.

CAS NUMBER: 7782-50-5 CHEMICAL NAME: CHLORINE

8EHQ-1282-0467 SUBMITTER: UNION CARBIDE CORPORATION

CAS NUMBER: 140-88-5 CHEMICAL NAME: 2-PROPENOIC ACID, ETHYL ESTER

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* Based on a preliminary evaluation, EPA believes that the submitted information did not warrant reporting pursuant to Section 8(e) of TSCA. In some cases, a submitting company was requested to provide the basis for its contention that the reported information offered reasonable support for a conclusion of substantial risk of injury to health and/or the environment as defined in EPA's March 16, 1978, TSCA Section 8(e) policy statement (Appendix A of this volume).